CAS LX 522
Syntax I

5

Constituents
(3.1-3.4)

The structure of sentences

1) You will give it to her
2) You will give the book to your roommate
3) You will give the book about syntax to your roommate's sister

- Someone doing the giving
- Something changing hands
- Someone receiving the thing

Sentential players

- It's like there's a "spot" for each of these players:

  1) __ will give __ to __

- And it doesn't matter whether the "player" is described with one word, two words, or several words.

Constituents

- Each "unit" of this sort is what we'll call a *constituent*. We enclose them in brackets to indicate that the words form (and behave as) a unit.

1) [You] will give [the book] to [your roommate].

- A significant property of language is that these units can be arbitrarily complicated:

2) [You] will give [it] to [Ed's roommate's sister's friend]

Arbitrarily complicated

- [Ed's roommate's sister's friend]

- This has sub-units within it:
  - [[Marge]'s friend]
  - [[Ed's roommate's sister]'s friend]
- And within that:
  - [[[Marge]'s sister]'s friend]
  - [[[Ed's roommate]'s sister]'s friend]
  - [[[[Ed]'s roommate]'s sister]'s friend]
- In general, it looks like wherever a <u>name</u> can go, so can [<u>name</u>'s <u>noun</u>].

[<u>name</u>'s <u>noun</u>]

- Wherever a <u>name</u> can go, so can [<u>name</u>'s <u>noun</u>].

  1) I gave the book to Homer.
  2) I gave the book to Bart's father.
  3) I gave the book to Lisa's brother's father.

- This replacement rule is *recursive*. The thing we are replacing is also contained in the thing we replaced it with.

Groups of groups of groups

- Sentences are made of *grouped* words. These groups can be contained in other groups, arbitrarily deep. A group of this kind: a *constituent*.
- Constituents can contain constituents that can contain constituents, etc.—The structure of a sentence is *hierarchical*.
- Constituents behave as a unit…

Constituents

- Functioning as a unit…
  - The students did <u>their syntax assignment</u>.
  - The students did <u>the crossword puzzle</u>.
  - <u>John</u> did the crossword puzzle.
  - <u>The crossword puzzle</u> is what John did.
  - *<u>Crossword puzzle</u> is what John did <u>the</u>.
  - John <u>likes</u> the crossword puzzle.
  - John likes the <u>jigsaw</u> puzzle.
  - John likes the <u>theater</u>.

Finding constituents

- How do we find constituents in a sentence? For many of them, we can guess, but a guess isn't evidence.
- The *structure* of a sentence has consequences.
- To find the constituents (to determine the structure) we test for the consequences.

Constituency tests

- Replacement test
- Fragment test
- Ellipsis
- Clefting
- Movement test

Replacement test

- A constituent is a group of words which function as a unit. If you can *replace* part of the sentence with another constituent (the smallest constituent being a single word), this tells us that the replaced section of the sentence is a constituent.
- This isn't foolproof, but it usually works if you try to keep the meaning as close as possible.

Replacement test

1) The students left.
2) **They** left.

- *The students* is a constituent.

1) The students will eat the sandwiches.
2) **They** will eat the sandwiches.
3) The students will eat **them**.
4) The students will **dine**.

- [The students] will [eat [the sandwiches]].

Sentence fragment test

- Generally, only constituents can be used in the fragmentary response to a question.
  - Who will eat the sandwiches?
    - **The students**. ***Students will eat the.**
  - What will the students do?
    - **Eat the sandwiches**. ***Eat the.**
  - What will the students eat?
    - **The sandwiches**.
- [The students] will [eat [the sandwiches]].

Ellipsis test

- If you can *elide* a string, it qualifies as a constituent.
  - Ellipsis is really deletion of a string from a sentence. Sometimes this is "repaired" by using the verb *do*, something which we will seek to explain at a later point.
- The professors will eat the sandwiches, and then..
- The students will.
- The students will eat the cookies, and then…
- *The professors will sandwiches.

WARNING: Passing a constituency test constitutes evidence for a constituent. Failing a constituency test tells you little—there may be other reasons for the ungrammaticality.

Movement (topicalization) test

- Sometimes you can "move" a string of words to the front of a sentence (then generally interpreted as the topic of the sentence). When you can, you've found a constituent.
  - The sandwiches, the students will eat _.
  - Eat the sandwiches, the students will _.
  - The students, they will eat the sandwiches.
  - *Students will, the eat the sandwiches.
  - *Students, the will eat the sandwiches
    - Failing a constituency test isn't evidence *against* constituency!

Clefting test

- Like the movement test, if you can fit your string into the frame *it be X that S* (where you move the string X from inside S), X is a constituent.
  - It's the sandwiches that the students will eat _.
  - It's the students that _ will eat the sandwiches.
  - It's eat the sandwiches that the students will (do) _.
  - *It's students eat that the _ will the sandwiches.
  - *It's eat the that the students will _ sandwiches.

Finding constituents

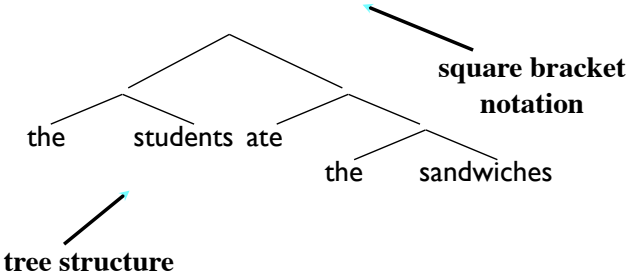
- Tests: Replacement, (ellipsis,) movement, clefting, fragment.
- Some to try:
  - Two African swallows can carry a coconut.
  - A cat was walking down the street.
  - A creature was stirring up trouble.
  - Flying planes can be dangerous.

And all through the house...

Bonus: the breakdown.

Trees, hierarchy, and constituency

- [The students] [ate [the sandwiches]]



Trees, hierarchy, and constituency

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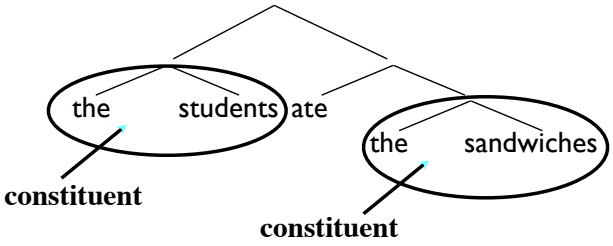

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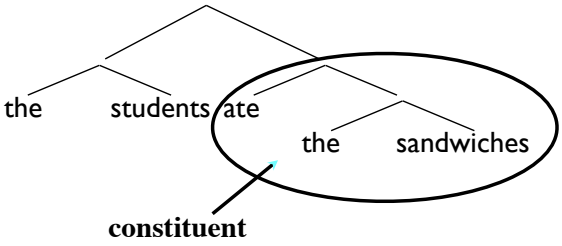
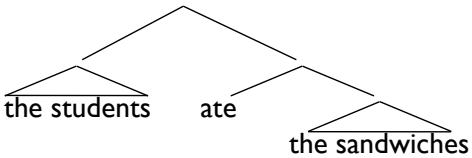
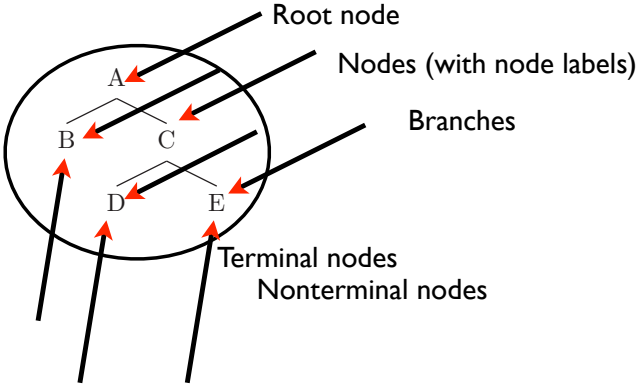


The triangle

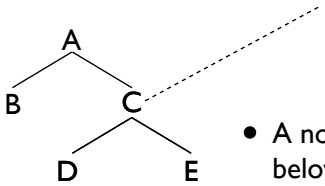
- Sometimes, when the internal constituency is unknown or unimportant to the current discussion, a triangle is used instead.



Trees

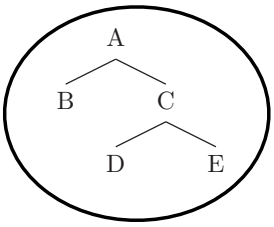


Tree relations



- A node X **dominates** nodes below it on the tree; these are the nodes which would be pulled along if you grabbed the node X and pulled it off of the page.
- Acts as a unit. Is a constituent.

Tree relations



- A node X *immediately dominates* a node Y iff X dominates Y and is connected by only one branch. Or, X is mother of Y.
- Nodes X and Y that share the same mother are sister nodes.

Verbs and substitution

- One of the ways we know a verb is a verb (category) is by observing that it can substitute for other verbs.
  1) Pat likes to sing. Pat likes to drive.
  2) Pat bought a book. *Pat bought (a) sing.
  3) Pat likes to eat sandwiches.
  4) *Pat unpleasant to eat sandwiches.
- So is *eat sandwiches* a verb?
- Well, kind of, yes.
- It's a constituent, a phrase, that has the properties a verb does. A *verb phrase*.

The making of a phrase

- We're trying to characterize our knowledge of syntactic structure.
- Our grammatical knowledge is a system (we can judge new sentences).
- All things being equal, a theory in which the system is simpler (needed fewer assumptions) is to be preferred over a theory that entails more complex one.

The making of a phrase

- In that spirit, we know that a phrase differs from a word in that it *contains* words (or other phrases).
- We've seen that when words are combined into a phrase, the phrase inherits the properties of one of the things we combined. (The phrase has a head).
- Suppose: a **phrase** can arise from **merging** two words together, with one taking priority. In a way, attaching one word to another.

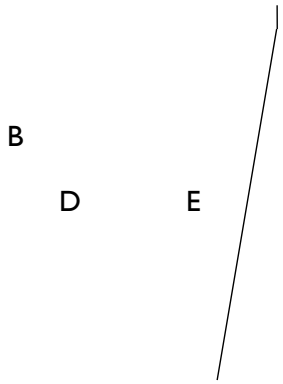
The making of a phrase

- What will Pat do?
  - sing
  - eat sandwiches
- What does Pat like?
  - to eat sandwiches
  - to sing
- [to [eat sandwiches]]
- So, a phrase can also arise from combining *to* and a verb phrase, to make a bigger phrase.

Merge

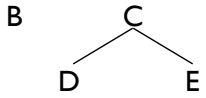
- So, let's go for the simplest theory of structure we can (and only move away from it if the simplest theory won't work)
- A phrase is a syntactic object formed by combining (*merging*) two syntactic objects, with the properties inherited from one of them (the *head* of the phrase).
- A word is a syntactic object.

Merge, in the abstract



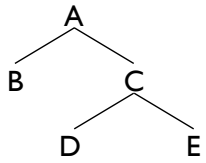
- A good way to think about this is that we have a number of syntactic objects lying around on a workbench of sorts.
- We use the operation Merge to assemble them together into one syntactic object.

Merge, in the abstract



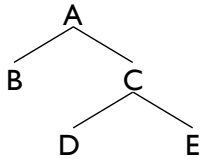
- We combine D and E using Merge to form a combined syntactic object.
- We need to call our new object something, so we call it C.
- C is now a syntactic object (containing D & E).
- D and E are now "off the table"—we can't Merge D with anything because it's inside C. ("Merge only combines objects at their root nodes").

Merge, in the abstract



- Since C is now a syntactic object, we can combine C with the other syntactic object, B, to form a new syntactic object we'll call A.
- Now, all we're left with is the single syntactic object A.

Merge, in the abstract



- When two objects are Merged, one of them is the **head**, the most important one.
- The head determines the properties of the constituent— that is, the features of the head **project** to become the features of the whole combined object.

Trees and constituency

- Pat will eat lunch.
- Pat will dine.

eat [V] lunch [N]

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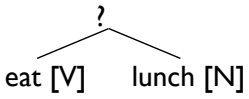

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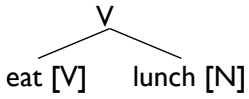

So how do we know which is the head?

- When we Merge two things, one is the head, and determines the properties of the resulting syntactic object.
- The next thing we'll turn to is the question of how the syntactic system knows which is the head.