

CAS LX 522 Syntax I

4

Constituents
(3.1-3.4)

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.
- 3) The students will eat the sandwiches.
- 4) **They** will eat the sandwiches.
- 5) The students will eat **them**.
- 6) 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!

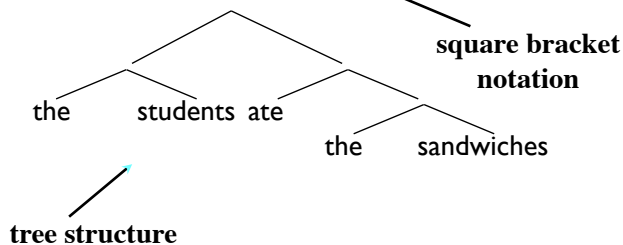
Clefting test

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.

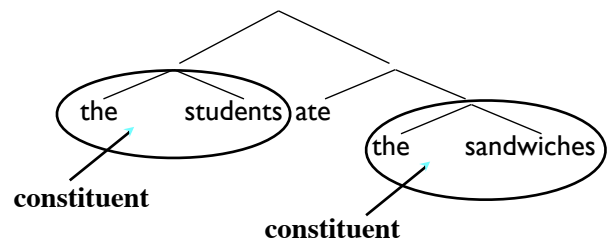
Trees, hierarchy, and constituency

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



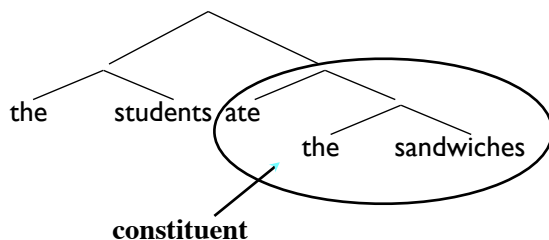
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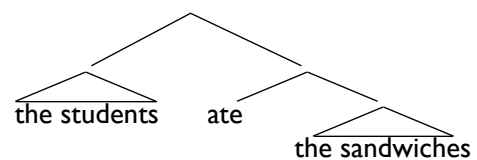
Trees, hierarchy, and constituency

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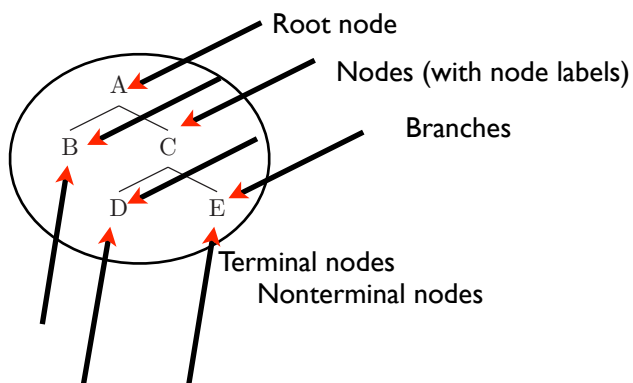


The triangle

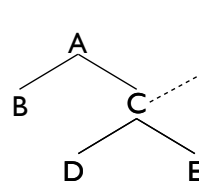
Sometimes, when the internal constituency is unknown or unimportant to the current discussion, a triangle is used instead.



Trees



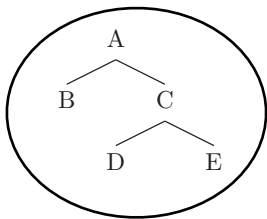
Tree relations



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.

Pat likes to sing. Pat likes to drive.

Pat bought a book. *Pat bought (a) sing.

Pat likes to eat sandwiches.

*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.

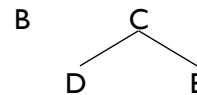
Merge, in the abstract



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



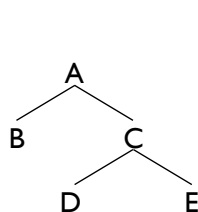
We combine D and E using Merge to form a combined syntactic object.

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").

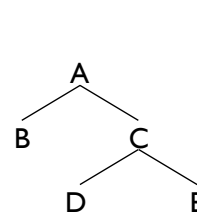
Merge, in the abstract



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.

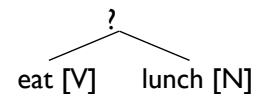
Trees and constituency

- Pat will eat lunch.
- Pat will dine.

eat [V] lunch [N]

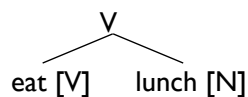
Trees and constituency

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Trees and constituency

- Pat will eat lunch.
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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.

This is a proposition

Let's try to ground this a bit more now, to make it clearer what problems we're *solving* here.

A primary—and perhaps the most important—type of sentence is that which represents a proposition.

A proposition is the kind of thing that can be true or false (basically).

Truth and Verbs

Michael swam.

Michael : refers to an individual; it is a name, a label. It is complete.

Swam : describes an action that can be undertaken by someone, or a property that someone can have. Someone. *Swam* can't be true—it needs an individual, then it can be true (or false).

Predicates and arguments

Suppose the construction of a proposition to be the end result of a (common kind of) sentence construction.

1) Michael swam

Swam needs an individual to be true or false. Fortunately, *Michael* is an individual. So, combining *swam* (predicate) and *Michael* (argument) gives us a proposition, that can be true or false.

Verbs and participants

Intransitive (1-place):

Sleep

Bill slept.

*Bill slept the book.

Transitive (2-place):

Hit

*Bill hit.

Bill hit the pillow.

Ditransitive (3-place):

Put

*Bill put.

*Bill put the book.

Bill put the book on the table.

Weather (0-place):

Rain

It rained.

Verbs and arguments

The “participants” in an event denoted by the verb are the arguments of that verb.

Some verbs require one argument, some require two arguments, some require three arguments, some require none.

Intuitively, the number of arguments is the number of things that a verb needs in order to make a proposition (something that can be either true or false).

Predicates

We will call verbs the predicates. They define properties of and/or relations between the arguments.

1) Bill hit the ball

▶ There was a hitting, Bill did the hitting, the ball was affected by the hitting.

Different arguments have different roles in the event. (e.g., The hitter, the hittee)

Thematic relations

The thematic relation that the argument has to the verb—the role it plays in the event—will prove useful in describing the behaviors of different classes of verb.

One thematic relation is agent of an action, like *Bill* in:

1) Bill kicked the ball.

Common thematic relations

Agent: initiator or doer in the event

Theme/Patient: affected by the event, or undergoes the action

1) Sue kicked the ball.

Experiencer: feel or perceive the event

2) Pat likes pizza.

Proposition: a statement, can be true/false.

3) Bill said that he likes pizza.

Common thematic relations

Goal:

1) Chris ran to Copley Square.

2) Pat gave the book to Tracy.
(Recipient)

Source:

3) Mary took a pencil from the pile.

Instrument:

4) Ed ate the burrito with a plastic spork.

Benefactive:

5) Pat cooked dinner for Chris.

Location:

6) Betsy sits under the tree on Wednesdays.

Thematic relations

Armed with these terms, we can describe the semantic connection between the verb and its arguments.

- Ray gave a grape to Bill.

Ray: Agent, Source, ...

A grape: Theme

Bill: Goal, Recipient, ...

Required vs. optional

Things with certain thematic relations don't seem to be *needed* by a given verb, but can be there. E.g., location.

Pat screamed (in the library).

Others, like theme/patient, goal, or agent, often do seem to be required. ("Required" means even if left out, there is something assumed)

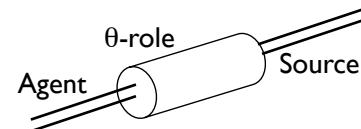
Chris gave a book to Pat.

θ -roles

An argument can participate in several thematic relations with the verb (e.g., Agent, Goal).

In the syntax, we assign a special connection to the verb called a " θ -role", which is a *collection* of thematic relations.

For the purposes of syntax, the θ -role (the collection of relations) is much more central than the actual relations in the collection.



θ -roles

We will often need to make reference to a particular θ -role, and we will often do this by referring to the most prominent relation in the collection.

For example, in *Bill hit the ball*, we say that *Bill* has the "Agent θ -role", meaning it has a θ -role containing the Agent relation, perhaps among others.

Unique θ Generalization

- Each θ -role must be assigned to a constituent, but a constituent cannot be assigned more than one θ -role.

Historically, the " θ -criterion:"

Verbs have a certain number of θ -roles to assign (e.g., *say* has two), and each of those must be assigned to a distinct argument.

Selection

Verbs, as part of their meaning (that is, whatever is recorded in the lexicon), are often “selective” about what kinds of arguments, θ -roles they have.

What verbs are said to do here is *select for* certain things.

There are quite a number of things that verbs “care about.”

(Category)-selection (“subcategorization”)

Verbs that take objects differ in what they allow the syntactic category those objects to be. Suppose *the ball* is category N (NP) and *that Bill left early* is category C (CP):

Sue saw/hit the ball.

Sue saw/*hit that Bill left early.

Feelings

The verb *feel* seems to have an Experiencer and a Theme/Source. But the Theme/Source can be any of several different syntactic categories. So: θ -role does not determine syntactic category; nor does syntactic category determine θ -role.

Pat felt a tremor.

Pat felt uncomfortable.

Pat felt that Chris had not performed well.

Kickings

The verb *kick* seems to require a nominal (category N) argument.

Verbs differ, so we need this to be recorded in the lexicon.

Kick is a verb. It has a [V] feature.

It “needs” a noun. Nouns have an [N] feature. But we need to distinguish between being and needing.

Interpretability

The difference between “being” and “needing” will be referred to as a difference in *interpretability*.

Being a verb, *kick* has an *interpretable* [V] feature.

Needing a noun, *kick* has an *uninterpretable* [N] feature.

The name gives a hint as to why the N is required. The uninterpretable [N] feature is dangerous. It must be gotten rid of. Otherwise, there will be something we can’t interpret.

Feature checking

For our model, we will say that if a syntactic object has an uninterpretable feature, it must Merge with a syntactic object that has a matching feature— and once it’s done, the requirement is met. The uninterpretable feature is checked.