

Sentential players

- It's like there's a "spot" for each of these players:
 - I) ____ 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.
- I) [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>].
 - I) 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 their syntax assignment.
 - The students did the crossword puzzle.
 - John 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 likes the crossword puzzle.
 - John likes the jigsaw puzzle.
 - John likes the theater.

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

- I) The students left.
- 2) They left.
- The students is a constituent.
 - I) 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)

- 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.

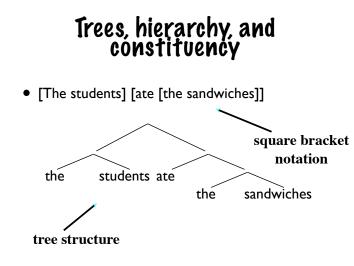
Finding constituents

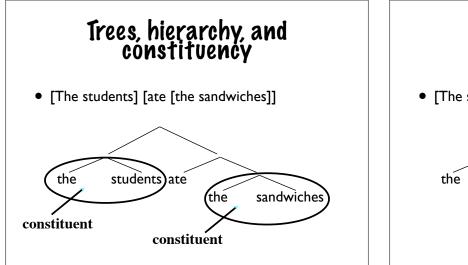
- Tests: Replacement, (ellipsis,) movement, clefting, fragment.
- Some to try:
 - Two African swallows can carry a coconut.
 - A cat was walking down the street.
 - A creature was stirring up trouble.
 - Flying planes can be dangerous.

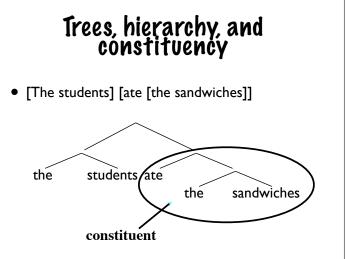
And all through the house...

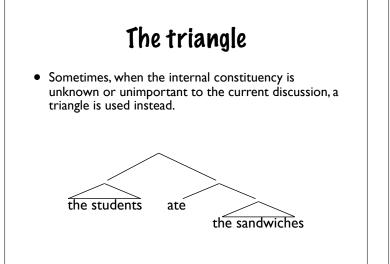


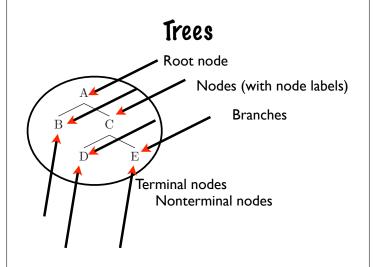


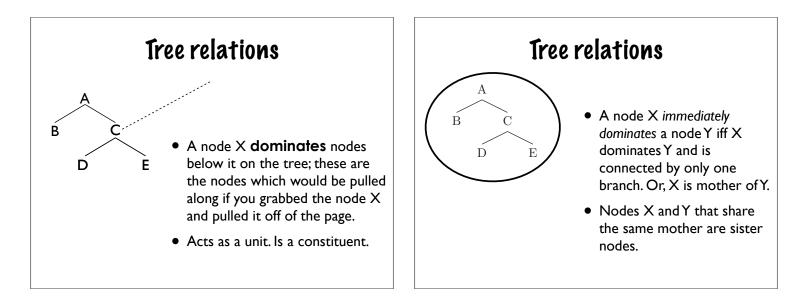












Verbs and substitution

- 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

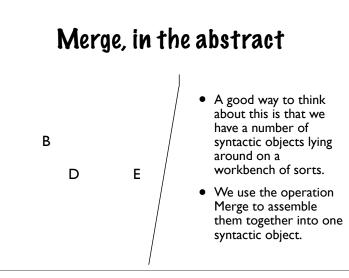
- In that spirit, we know that a phrase differs from a word in that it *contains* words (or other phrases).
- We've seen that when words are combined into a phrase, the phrase inherits the properties of one of the things we combined. (The phrase has a head).
- Suppose: a **phrase** can arise from **merging**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

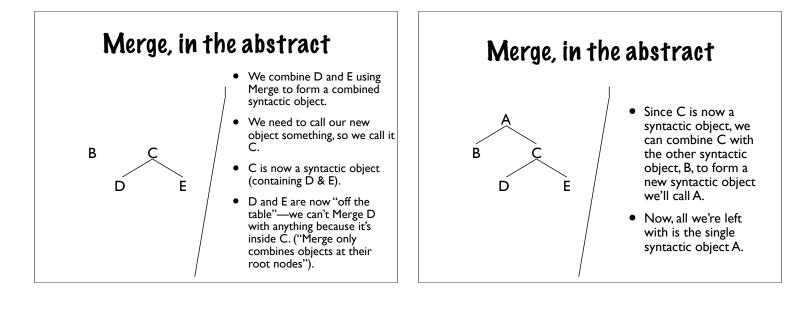
The making of a phrase

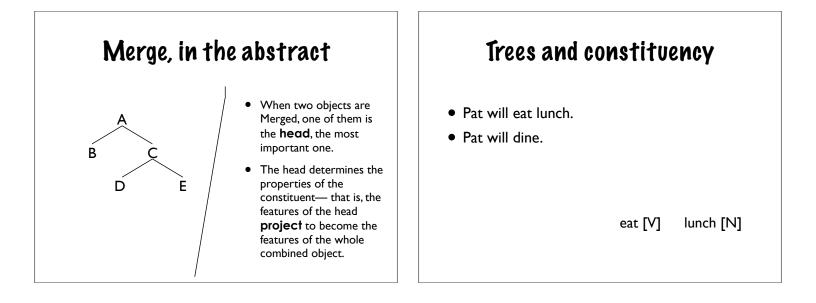
- What will Pat do?
 - sing
 - eat sandwiches
- What does Pat like?
 - to eat sandwiches
- to sing
- [to [eat sandwiches]]
- So, a phrase can also arise from combining to and a verb phrase, to make a bigger phrase.

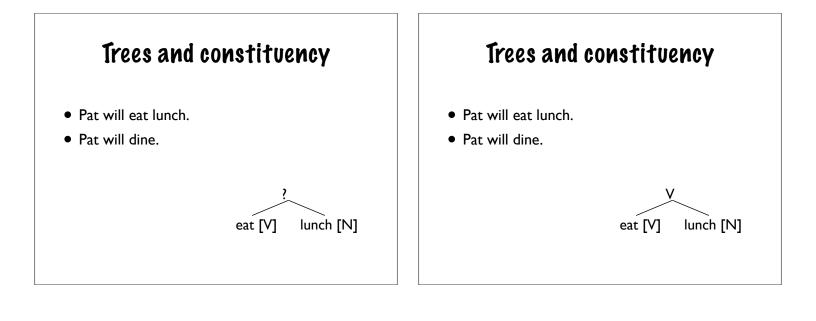
Merge

- 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.









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

I) 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.
- I) 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
 - I) Bill slept.
 - 2)*Bill slept the book.
- Transitive (2-place): *Hit*
 - 3)*Bill hit.
 - 4) Bill hit the pillow.

- Ditransitive (3-place): Put
 - 5)*Bill put.
 - 6)*Bill put the book.
 - 7) Bill put the book on the table.
- Weather (0-place): Rain

8) 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.
 - I) 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:
 - I) Bill kicked the ball.

Common thematic relations

- Agent: initiator or doer in the event
- Theme/Patient: affected by the event, or undergoes the action

I) Sue kicked the ball.

- Experiencer: feel or perceive the event
 - 3) Pat likes pizza.
- Proposition: a statement, can be true/false.
 - 3) Bill said that he likes pizza.

Common thematic relations

- Goal:
 - I) Chris ran <u>to</u> <u>Copley Square</u>.
 - Pat gave the book <u>to Tracy</u>. (Recipient)
- Source:
 - 3) Mary took a pencil <u>from the pile</u>.

- Instrument:
 - 4) Ed ate the burrito <u>with a</u> <u>plastic spork</u>.
- Benefactive:
 - 5) Pat cooked dinner <u>for</u> <u>Chris</u>.
- Location:
 - 6) Betsy sits <u>under the tree</u> on Wednesdays.