

7/2/07: Some topics in syntax

Ideas for today:

- Constituency
- Ambiguity
- Argument structure

Compositionality

Language is *compositional*

- Sounds consist of features.
- Morphemes consist of sounds
- Words consist of morphemes
- *Phrases* consist of words
- Sentences consist of phrases

Constituency

- A phrase is also known as a *constituent*: a (string of) lexical item(s) that functions as a single syntactic unit.
- Each of these units belongs to a category (VP, NP, PP) based on the category of its *head*
- How can we determine the category and contents (“edges”) of a given phrase?

Conjunction

- Words and phrases of the same category can be combined using **conjunctions** (e.g. *and*, *but*, *or*)
-
- NP => NP conj NP Cats **and** dogs are furry.
- VP => VP conj VP He will sink **or** swim.
- S => S conj S You can run **but** you can't hide.

Ungrammatical coordination

- Different categories cannot be conjoined

Julia wrote a memo.

Julia wrote to the dean.

*Julia wrote [a memo] and [to the dean].

NP

PP

Coordination test

Laura loves linguistics.

Laura teaches enthusiastically.

Laura loves linguistics and teaches enthusiastically.

Conclusion:

[loves linguistics] and [teaches enthusiastically]
are the same kind of constituent: VP

Coordination test

- Reveals information about:
 - Whether a group of words is a constituent:
 - (a) I [_{VP} slept].
 - (b) I [[slept] and [dreamed about linguistics]]
 - (c) *I [slept and dreamed] about Linguistics
 - What kind of constituent it is:
 - I saw [[deer] and [*florp*]] in the meadow.
 - I want to [[run] and [*florp*]] in the meadow.

Tests for Constituent structure

- Substitution
- Movement
- Deletion

Constituency test #1: Substitution

- Only constituents can be replaced by shorter words/phrases

Substitution: NP

- Substitute for NPs with pronouns (*he, she, it, they, etc.*)
 - My TA will buy the Battlestar Galactica DVD tomorrow.
 - Rita will buy *it* Wednesday. NP[the BSG DVD]
 - *She* will buy 'V' for Vendetta next week. NP[My TA]

Substitution: NP cont.

- I saw the big fat hairy guy that you met while shopping at the new department store in downtown Seattle.
 - I saw him too.
- I watched my favorite movie last night.
 - *I watched my favorite it last night
 - Must replace the *entire* constituent.

Coordination and Substitution

- [The professor and a TA] were talking to [several students and some faculty] about the joy of syntactic analysis.
- [They] were talking to [them] about [it].
- [[She] and a TA] were talking to...

Substitution: VP

- Substitute for VPs with *as*, *so*, **do/done**
so

Laura has eaten lots of Halloween candy.

- **As** has Julie.
- **So** has George.
- Matt has **done so** too

VP substitution cont.

→ AUX (has, will, etc.) is outside the VP constituent.

- John will [study linguistics and love it]
- Mary will [do so] too.
- *Mary [do so] too

VP substitution and coordination

- John will [_{VP} [go to the linguistics lecture] and [learn about syntax]].
- Mary will [do so] too.
- Mary will [[go to the lecture] and [do so]] too.

Constituency test #2: Movement

- Constituents can move to positions in the sentence other than where they would normally go
 - Obligatory: Question formation
 - Optional: Topicalization

Word Order

- English is an SVO language:

Subject – Verb – Object

Harry rides brooms.

Ron makes jokes.

Trevor eats flies.

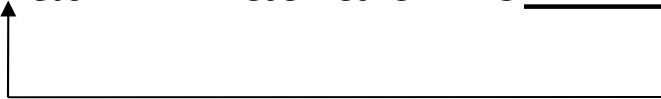
- *Movement* operations change this order

Obligatory Movement

■ *Question formation:*

“Laura will drive her car on the weekend.”

What will Laura drive _____ on the weekend?



When will Laura drive her car _____?



Obligatory Movement cont

- **What* will Laura drive [her ____] on the weekend?
- **When* will Laura drive her car [on the _____]?
- Movement must involve the *whole constituent*!

Optional Movement

- *Topicalization*: optional movement used to emphasize something: O - S - V

- I don't like peas, but peanuts I like _____.



- They didn't think he could win the election, but win the election he did _____.



Coordination and Movement

- John ate [_{NP} beans and rice]
- What did John eat _____ ?
- *What did John eat [_{NP} beans and _____]?
- This constraint is universal.

Ambiguity

- The property of having two or more meanings.
 - Lexical ambiguity
 - Structural ambiguity

Lexical ambiguity

Headlines:

- PROSTITUTES APPEAL TO POPE
- IRAQI HEAD SEEKS ARMS
- SOVIET VIRGIN LANDS SHORT OF GOAL AGAIN
- CHILD'S STOOL IS GREAT FOR USE IN GARDEN
- **Lexical ambiguity:** when a word has more than one meaning

Structural ambiguity

- “I once shot an elephant in my pajamas.”
- “Tonight’s program will discuss sex with Dr. Ruth Westheimer.”
- “We will not sell gasoline to anyone in a glass container.”
- “This mixing bowl is designed to please any cook with a round bottom for efficient beating.”

Structural ambiguity

- Ambiguity resulting from the *structure* of the phrase or sentence

e.g., discuss [sex with Dr. Ruth Westheimer]
[discuss sex] [with Dr. Ruth Westheimer]

e.g., a large [man's hat]
[a large man's] hat

Constituency and Structural Ambiguity

- Constituency tests can show us the exact source of the the ambiguity.
- Let's try replacement and question formation

Constituency tests : Keep the meaning!

- John hit the man with the bat
- Replacement:
 - (a) John hit *him*
 - (b) John hit *him* with the bat.
- Structures for (a) and (b)
 - John [_{VP} hit [the man [with the bat]]]
 - John [_{VP} hit [the man] [_{PP} with the bat]]]

Keep the meaning!

- Question formation:

(a) Who did John hit _____ ?

(b) Who did John hit _____ with the bat?

- Structures for (a) and (b)

- John [_{VP} hit [_{NP} the man [_{PP} with the bat]]

- John [hit [the man] [_{PP} with [_{NP} the bat]]]

Argument Structure

- Verbs need certain other elements to be fully interpretable:
 - *John kissed
 - *Mary put the car
 - *Slept
 - These elements are called *arguments* and different verbs require different kinds.

Intransitives

- Some verbs only take a “doer.” These are called “intransitives.”
 - John slept.
 - Mary snores.
 - *The teacher sneezed the table.

Transitive

- Other verbs require a “doer” and a “receiver.” These are called “transitive.”
 - John hit the bank robber.
 - Mary kissed John.
 - *The dog bit _____.

Ditransitive

- Other verbs require a “doer,” a “receiver” and something else. These are called “ditransitive.”
- John put the spoon in the cupboard.
 - *John put ____ in the garage.
 - *The teacher placed the chalk ____.
- John gave the card to his mother.
 - ??John gave the card ____.

Other kinds

- Different verbs require different things:
- My mother said I should get a real job.
 - say: NP __ S
- Mary told John she loves him.
- *Mary told _____ she loves him.
 - tell: NP __ NP + S

Thank you!

Can you figure out the ambiguity of the following sentence?

Next year, all our students will be teachers.