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*)

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- 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 <u>a memo</u>.

  Julia wrote <u>to the dean</u>.

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

           NP   PP

Coordination test

Laura <u>loves linguistics</u>.

Laura <u>teaches enthusiastically</u>.

Laura loves linguistics <u>and</u> 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.)
  - <u>My TA</u> will buy <u>the Battlestar Galactica DVD</u> 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 <u>the big fat hairy guy that you met while shopping at the new department store in downtown Seattle</u>.
  - I saw <u>him</u> too.
- I watched <u>my favorite movie</u> last night.
  - *I watched my favorite <u>it</u> last night
  - Must replace the *entire* constituent.

Coordination and Substitution

- [<u>The professor</u> and <u>a TA</u>] were talking to [<u>several students</u> and <u>some faculty</u>] about <u>the joy of syntactic analysis</u>.

- [They] were talking to [them] about [it].

- [[She] and <u>a TA</u>] 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 <u>her car</u> <u>on the weekend</u>."

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 ____]?

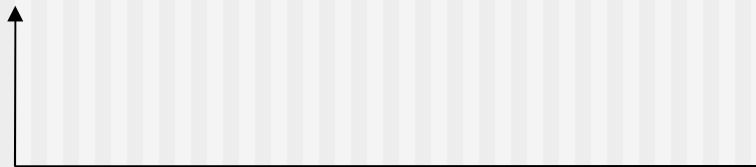- Movement must involve the *whole constituent*!

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 <u>the man with the bat</u>
- 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."
  - <u>John</u> slept.
  - <u>Mary</u> snores.
  - *<u>The teacher</u> sneezed <u>the table</u>.

Transitive

- Other verbs require a "doer" and a "receiver." These are called "transitive."
  - <u>John</u> hit <u>the bank robber</u>.
  - <u>Mary</u> kissed <u>John</u>.
  - *<u>The dog</u> bit <u>____</u>.

Ditransitive

- Other verbs require a "doer," a "receiver" and something else. These are called "ditransitive."

- <u>John</u> put <u>the spoon</u> <u>in the cupboard</u>.
  - *<u>John</u> put ___ in the garage.
  - *<u>The teacher</u> placed <u>the chalk</u> ___.

- <u>John</u> gave <u>the card</u> <u>to his mother</u>.
  - ??<u>John</u> gave <u>the card</u> ___.

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.