Recap

Last time...

- We revised how we identify **head** and **complement** within a phrase —

> When two constituents **Merge**, the **complement** is the one that can “grow” into more than a word.

⇒ leaving us with one unanswered question:

- Is it sufficient to have a theory where a constituent can be either:
  1. a single word
  2. the result of applying **Merge** to a single word and some other constituent

  ➢ In other words:
  
  Are there instances where complex constituents — consisting of more than a single word — **Merge** with other constituents, that are themselves complex?

More complex constituents

- We have seen DPs of the following sort:

  1. \[ DP \{ a \{ NP \text{contribution} \} \} \]
  2. \[ DP \{ the \{ NP \text{promises} \} \} \]
  3. \[ DP \{ a \{ NP \text{book [PP about [DP a [NP \text{vampire}]]]]} \} \]

- but these, of course, are not the only kind of DPs one finds

  1. John’s contribution
  2. a politician’s promises
  3. the author’s book about a vampire

First of all, why are we so sure these are DPs?

- **RECALL**: our original motivation for DP as a **category** was **distributional**

  - namely, that adjectives (like **certain**) refused to take these constituents as their complements

    - while closely related verbs (like **believe**) readily **merged** with those same constituents
More complex constituents

- This distributional argument holds of these constituents, just as it does for the “original” DPs we looked at:

  (3)  a. * Mary is appreciative\textsubscript{(A)} [John’s contribution].
      b. * The people are usually suspicious\textsubscript{(A)} [a politician’s promises].
      c. * The publisher is dismissive\textsubscript{(A)} [the author’s book about a vampire].

  (4)  a. Mary appreciates\textsubscript{(V)} [John’s contribution].
      b. The people usually doubt\textsubscript{(V)} [a politician’s promises].
      c. The publisher rejected\textsubscript{(V)} [the author’s book about a vampire].

- What is the head of [John’s contribution]?
  - can it be contribution (N)?

  (5)  [John’s [contribution to the foundation] ]
      - contribution, just as in [DP the contribution], can be part of a complex constituent (to the exclusion of John’s)
      \[\Rightarrow\] contribution (N) cannot be the head of [John’s contribution]

- Consider the following:

  (8)  a. John’s contribution
      b. * John’s a contribution
      c. * John’s the contribution
      - even though it seems there’s nothing semantically wrong with constructions like (8b–c)
      \hspace{1em} \text{cf. (9a–b)}:

  (9)  a. a contribution by John/of John’s
      b. the contribution by John/?of John’s
More complex constituents

⇒ ’s and a/the are in complementary distribution
  o which is a fancy way of saying only one can appear, but not both
    (just like a and the are, themselves, in complementary distribution)
      ➢ which suggests that… ’s is a D(eterminer)!
  • So ’s is the head of these constituents (repeated from earlier):

(10) a. [DP John ’s(D) [NP contribution]]
    b. [DP a politician ’s(D) [NP promises]]
    c. [DP the author ’s(D) [NP book about a vampire]]

But that leaves us with the question:
  • What are John/a politician/the author, in terms of phrase-structure? NOTICE:
    o We might not be sure — at this point — what the category of John is
    o but we know what the category of a politician and the author is
      ➢ they are DPs

More complex constituents

⇒ We’re dealing with DPs that consist of an NP, a D head, and another DP!

(11) a. [DP [DP John ’s(D) [NP contribution]]]
    b. [DP [DP a politician ’s(D) [NP promises]]]
    c. [DP [DP the author ’s(D) [NP book about a vampire]]]

  • What is the structural organization of these sub-constituents?
(12) “FLAT”
(13) BINARY BRANCHING
The category of sentences

• Before answering this question, let us look once more at our inventory of lexical categories:
  ◦ **verbs:**
    - \([\text{VP} \text{kick}_{(V)}]\)
    - \([\text{VP} \text{kick}_{(V)} \text{[DP the ball]}]\)
  ◦ **nouns:**
    - \([\text{NP} \text{path}(N)]\)
    - \([\text{NP} \text{path}(N) \text{[PP to the fountain]}]\)
  ◦ **determiners:**
    - \([\text{DP the(D)} \text{[NP path]}]\)
  ◦ **prepositions:**
    - \([\text{PP on(P)} \text{[DP the(D)} \text{[NP table]}\text{]}]\)
  ◦ **complementizers:**
    - \([\text{CP that(C)} \text{[?, the kid kicked the ball]}]\)
    - \([\text{CP whether(C)} \text{[?, the kid kicked the ball]}]\)

⇒ What is the category of C’s complement?
  ◦ In other words, what is the category of a sentence??

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The category of sentences

• Given what we saw for DPs, it is now reasonable that the initial DP (the “subject”) in the sentence (the kid kicked the ball) is not the head
  ◦ just like the possessor in a DP is not the head of that DP
    (the politician’s contribution to the foundation)
  ➢ So is the verb (e.g., kick(ed)) the head of the sentence?
    ◦ i.e., is a sentence really a VP?
• If we look at unembedded sentences or at complements of that(C), the verbs in those sentences have a property that is not shared by all VPs

(14) a. The kid kicked the ball.
  b. Mary knew that the kid kicked the ball.

(15) a. The kid kicks the ball.
  b. Mary knew that the kid kicks the ball.

(16) The kid wanted to kick the ball.
(17) To kick the ball is not as exciting as to head it.
The category of sentences

➢ Tense! (present/past/etc.)
  o every unembedded sentence or complement of that(C) has tense
  o but not every VP has tense

• In fact:
  o we have been looking at what traditional grammarians call “present simple” and “past simple”
  o in these, the tense morphology (e.g., -ed) is fused with the verb
  o if we look at other tenses, we can see (at least part of) the tense morphology as a separate word:

  (18) a. The kid has kicked the ball.
      b. The kid is kicking the ball.
      c. The kid will kick the ball.

In the so-called “simple” tenses, something makes the tense-morphology appear on the verb, rather than as a separate word; we must account for what this something is! More on this later.

• NOTE: people sometimes use the terms I(P) instead of T(P)
  – these are two different names for the same thing

Binary branching vs. “flat” structures

• We can now ask the same question about TPs that we asked earlier about DPs:

  (20) “FLAT”

  ➢ [TP [DP The kid] will(T) [VP kick the ball]].

  (21) BINARY BRANCHING

  ➢ [TP [DP The kid] T [VP will kick the ball]].

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Binary branching vs. “flat” structures

- There might be some theoretical reasons to prefer the *binary branching* alternative (e.g., (21))
  - For example, it could be argued that a system that allows only *binary branching* nodes is somehow “simpler” than a system that allows both *binary branching* nodes and *ternary branching* ones

➢ But we’re all about **external evidence**, here!

(22) a. John will [eat an apple and drink a soda].
   b. John will eat [an apple or a peach].

- Constructions like (22a–b) are called ** coordinations**

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Binary branching vs. “flat” structures

- Compare (22a–b) with the following examples:

(23) a. ??John will buy the and sell the lemon.
   b. ??Mary will read a report on or a column about it.

**QUESTION:** Why are (23a–b) significantly worse than (22a–b)?

**ANSWER:** (23a–b) are coordinations of strings that are not constituents

(24) a. 
   b. 

➢ There is no single node that dominates *buy the* and nothing else

≡ *buy the* is not a constituent

(and the same is true for *sell the*)
Binary branching vs. “flat” structures

- This contrasts with the examples in (22a–b), repeated here:

(22) a. John will [eat an apple and drink a soda].
    b. John will eat [an apple or a peach].
- In (22a–b), we are coordinating constituents (VPs and DPs, respectively)
- To see this, let us consider (22b) in more detail:

(25) a. VP
    | D
    | NP
    | V
    | an
    | N
    | apple

➢ There is a single node that dominates *an apple* and nothing else (namely, the DP node)
≡ *an apple* is a constituent
(and the same is true for *a peach*)

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**Binary branching vs. “flat” structures**

⇒ coordination is a constituency test

A CAVEAT

Given a coordination that we expect to be infelicitous, prosody and/or intonation can sometimes (though not always) be manipulated to render it felicitous.

(26) John tweeted about, and Mary wrote an extensive report on, the meeting that took place the day before yesterday.

(an example of a phenomenon known as Right Node Raising, or RNR)

- This example has essentially the same structure as (23b), above:
  - the conjunct *tweeted about* consists of a V and a P, without the DP complement of P
    ⇒ not a constituent
➢ but the prosodic structure of (26) (orthographically represent using commas) makes it felicitous, nonetheless

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Binary branching vs. “flat” structures

However. . .

I. We can still use coordination as a constituency test, if we are careful to “trust” only those coordinations that don’t require special intonation

II. There are coordinations that no amount of prosody and/or intonation can rescue
  - e.g., (23b), repeated here:

(23) b. *Mary will read a report on, or a column about, it.

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Binary branching vs. “flat” structures

- With this baseline in place, let’s take a closer look at the T(ense)P(hrase):

(27) a. Mary has trained and will win.
   b. ?? John might and Mary will win.

Observations:
- Suppose the “flat” structure for TPs is correct:

(28) TP
    |   VP
    |   V
    |   win
    T    will
    DP   Mary
c  First, according to (28), neither will win nor Mary will should be constituents
⇒ neither (27a) nor (27b) should be grammatical — contra to fact
  Second, even if our theory of coordination were entirely wrong (which it’s probably not) —
⇒ it seems there wouldn’t be any other way to capture the difference between (27a) and (27b), in structural terms

On the other hand, if the binary branching structure for TPs is correct:

(29) TP
    |   VP
    |   V
    |   win
    T    will
    DP   Mary

Given (29):
  There is a node (the one labeled ‘?’) which dominates will win and nothing else
⇒ will win is a constituent
  In contrast, there is no node that dominates Mary will and nothing else
⇒ Mary will is not a constituent

⇒ the binary branching structure has better empirical coverage
- What’s left is to name this ‘?’ node
  It’s not the entire phrase — that’s TP; and it’s not the head — that’s T
⇒ so we call it T’ (sometimes written as T0, or “T-bar”)
  and to make sure we don’t confuse T (the head) with T’, we start calling the head T0
X’-theory

⇒ Here’s what our trees now look like:

(30) \[ \text{TP} \]
\[ \text{DP} \quad \text{T'} \quad \text{VP} \]
\[ \text{Mary} \quad \text{T}^0 \quad \text{will} \quad \text{win} \]

(31) \[ \text{TP} \]
\[ \text{DP} \quad \text{T'} \quad \text{VP} \]
\[ \text{The kid} \quad \text{T}^0 \quad \text{will} \quad \text{kick} \quad \text{DP} \quad \text{the ball} \]

➢ We have seen detailed motivation for this articulated structure for TPs
• As before, we’ll skip ahead, and assume (for pedagogical purposes) that we’ve looked at other categories
  o and been convinced that the same schema should apply to those categories, as well
  (as always, evidence available upon request)

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X’-theory

• So, for example, we can now draw an articulated structure for DPs that contain possessors, along the same lines:

(32) \[ \text{DP} \]
\[ \text{DP} \quad \text{D'} \quad \text{NP} \]
\[ \text{a politician} \quad \text{D}^0 \quad \text{'s} \quad \text{N} \quad \text{promises} \]

o NOTICE:
  the DP \( [\text{DP a politician}] \) is a separate DP
  – which is embedded within the larger DP in (32)
  (just like \( [\text{DP the kid}] \) was embedded within the larger TP in (31))
X’-theory

- The general schema that emerges from this is known as the \textit{X’-schema} (\textit{\textit{X}-schema}, \textit{X-bar schema}):  

\begin{align}
\text{\textit{THE X’-SCHEMA}} & \quad \text{\textit{\textit{X}-schema}} \\
\text{XP} & \quad \text{X' schema} \\
\text{ZP} & \quad \text{X'YP} \\
\cdots & \quad \text{X0YP} \\
\cdots & \quad \text{X0 ZP} \\
\end{align}

\[ X' \]

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X'-theory

- The general schema that emerges from this is known as the X'-schema (X-schema, X-bar schema):

\[ \text{THE X'-SCHEMA} \]

\[
\begin{array}{c}
\text{XP} \\
\text{ZP} \\
\ldots \\
\text{X}^0 \\
\text{YP} \\
\ldots
\end{array}
\]

- Some more terminology:
  - we call X⁰, X', and XP the projections of X
  - X⁰ is the minimal projection
  - X' is the intermediate projection
  - XP is the maximal projection

\[ \Rightarrow \text{heads} \equiv \text{minimal projections} \]
\[ \text{phrases} \equiv \text{maximal projections} \]

- NOTICE: There is little (if anything) new on the current slide, theoretically speaking!
  - terminology can be scary, but it’s still just terminology 😊

X'-theory

- Finally, just like we saw with complements, sometimes specifiers are present and sometimes they are absent

(34) **(SOME) COMPLEMENTS ARE OPTIONAL**
  a. John has \[ VP \text{[ eaten[} V^0 \text{]} \]. – no complement to V⁰
  b. John has \[ VP \text{[ eaten[} V^0 \text{] [DP an apple] \]. – with complement to V⁰

(35) **(SOME) SPECIFIERS ARE OPTIONAL**
  a. \[ DP \text{[ D' an[D⁰] [NP apple] \] – no specifier for DP}
  b. \[ DP \text{[ D' Bill [D' s[D⁰] [NP apple] \] – with specifier for (outer) DP}

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X’-theory

- and just like we did for complements, we can draw the relevant levels of structure whether these elements are present or not

(36) a. 

b. 

g. i.e., D°, D’ and DP are all represented
- whether there is a specifier (as in (36b)) or not (as in (36a))
- in contrast to the XP-level, we will sometimes graphically omit the X’-level if there is no specifier

References