

CP → C TP  
TP → NP T VP  
VP → V (NP) (PP) (CP)  
NP → (Det) (A) N (PP)  
PP → P (NP)

V=buy, eat, put...

N=John, book, chocolate...

John hit the man with the pillow (with a beanbag) [mention triangles]  
recursive, allow us to describe attachment ambiguities  
some terminology: **immediately dominates, dominates, sister, daughter**

now these rules have two problems (well, plus one, for a grand total of three):

- (1) largely redundant with stuff we're going to have to state in the lexicon anyway (**selection**)
- (2) insufficient internal structure (more about this next time)
- (3) quite unrestrictive; no reason not to have a rule NP → AP CP.

Consider the VP rule:

VP → V (NP) (PP) (CP)

We said before that we're going to combine these rules with lexical entries to get fragments of English. Lots of lexical choices won't work out, of course:

the dragon

- ...devoured the villagers
- \*...devoured
- ...rejoiced
- \*...rejoiced his victory

John...

- ...put the book on the table
- \*...put the book
- \*...put on the table

classic observation, kicked up a notch; some verbs are transitive, requiring NP objects, and others are intransitive, disallowing them; and in fact verbs can require other things, like PPs (cf. *put*).

So in the lexical entry for *put* we'll need to have the information "needs an NP and a PP". Once we have that information there, do we really want to restate it in a phrase structure rule?

**selection**, which we'll be talking about more later. Heads get to **select** for certain types of phrases.

Not everything has to be selected, though (add "in Omaha", "at 3:00" to the above examples)→ you can do anything in Omaha. **complements, adjuncts**

selected ≠ obligatory! John ate (an apple)

problem #2: these PS rules are insufficiently fine-grained (in ways that seem to care about selection...hmm)

John decided on the boat [ambiguous]

John decided on the boat on the plane [unambiguous]

(John decided on the boat in Omaha,

John decided in Omaha on the boat (unambiguous))

selected material (head and complement) forms a unit that excludes the unselected material (adjunct) **[diagram, introduce V']**

...and Mary did so on the plane [unambiguous?]

Same deal with NP:

student of physics from Brazil

\*student from Brazil of physics

Brazilian physics student

\*physics Brazilian student

...and one from Brazil

\*...and one of physics

...and a Brazilian one

\*...and a physics one

alleged student from Brazil (ambiguous)

alleged student of physics (unambiguous)

alleged Brazilian student

Brazilian alleged student

student from Brazil with green hair  
student with green hair from Brazil  
\*student of physics of chemistry

**complements** vs. **adjuncts**, selection determines the difference, selection determined by lexical entry.

so there are intermediate projections. Here's an algorithm for constructing trees:

1. take two things, A and B, and put them together to form a third thing, C (**Merge**)
2. C gets the label of either A or B.
3. Repeat until finished.

**Bare Phrase Structure.** Requires projections to be endocentric, and allows for intermediate levels of projection. Unlike our PS rules, doesn't say much about which things can combine with which other things; the hope is that other factors will take care of that (e.g., selection—figuring out the rest of the other factors will be one of our big topics).

Bar levels (XP, X', X) are predictable from the structure (XP=undominated by other projections of X, X=doesn't dominate further nodes, X'=other), but we'll put them in for ease of processing trees; just don't take them too seriously.

The trees we end up with resemble those that were generated by the **X-bar schema**, with the difference that the X-bar schema required more nonbranching projections, which were never shown to be necessary.

The algorithm we've got also makes branching binary, though that isn't strictly necessary. Right now TP is ternary. Any way to figure out if that's right? New diagnostic for constituency; **coordination**.

John bought [an apple] and [a lemon]  
Mary [bought an apple] and [sold a lemon]

handle with care: **Right Node Raising**

[John bought], and [Mary sold], a shiny new lemon

*john bought* had better not be a constituent, or we're in trouble. We can recognize RNR by several diagnostics; (1) intonation, (2) RNR'ed phrase must itself be a constituent?

\*[John bought], and [Mary sold], a shiny new lemon yesterday

So, with that caveat, consider:

I [have won the lottery] and [will never work again]

T' constituent, everything now binary. Binary branching always required? We'll come back to that much later.