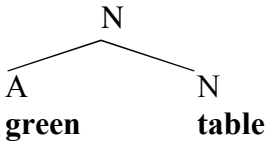
Review Handout #1: Phrase Structure

The rules for phrase structure that we've now settled on involve constructing trees via the following algorithm:

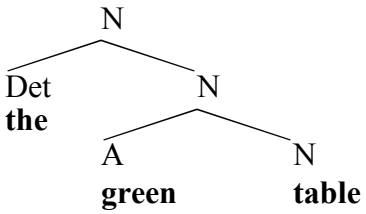
(1) Take two things, A and B, and **Merge** them to form a new thing, C.
(2) Give C the label of either A or B.
(3) Repeat as necessary.

This is the algorithm of **Bare Phrase Structure**. To give a concrete example, here's how you might construct a prepositional phrase like [*under the green table*]:

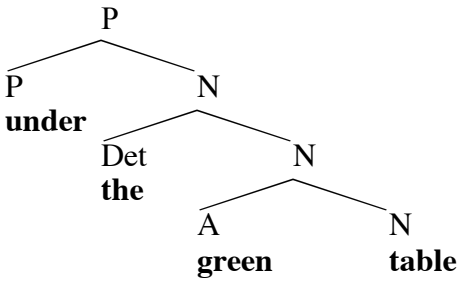
(i) Merge *green* and *table*, projecting the label of *table* to the new constituent:



(ii) Merge *the* and *green table*, projecting the label of *green table*:



(iii) Finally, Merge *under*, projecting the label of *under*:



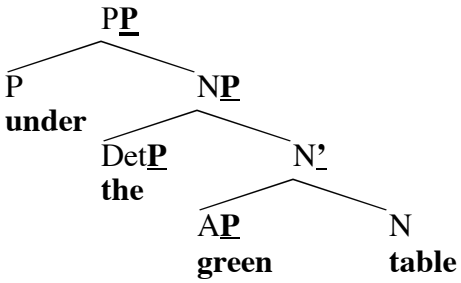
Now, in the above trees, I haven't distinguished between nodes with the same label; there aren't any NPs or N's here. Like most syntacticians, I actually find that Ps and 's make trees easier to process, so I'll add them. But it's worth emphasizing that these aren't supposed to have any real status as part of the syntactic representation; they're just there to make trees easier to read. You can add them using the following convention:

(4) Given a sequence of nodes with the same label X in immediate dominance relations with each other:

a. the node which is not dominated by any other nodes is XP.
b. the node which does not dominate any other nodes is X.
c. all the other nodes are X'.

That convention assigns the following labels for the tree in (iii):

(iii)'

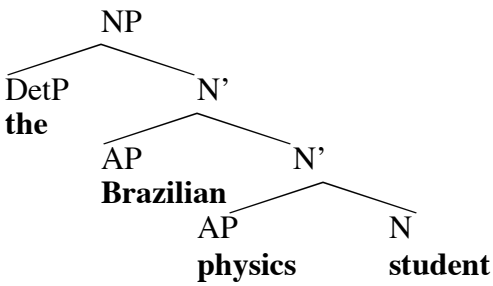


The convention underdetermines how we ought to treat things like *green* and *the* in this tree, which are both the highest and the lowest nodes in their (very short) sequences; we could equally well call *green* an A or an AP, for example. Feel free to do whatever you want.

Bare Phrase Structure is part of a movement in syntax called **Minimalism**, which emphasizes getting by with a bare minimum of syntactic apparatus. It's clear that we have to create trees that consist of phrases; the facts don't give us any way out of that. The simplest way to create complex objects out of simple objects is (arguably) to take two simple objects and put them together to form a new object, and just keep doing that until you're done. This is (almost) the only kind of operation used here. The only other component of the algorithm in (1-3) is projection of labels; again, the facts seem to demand labels, so the simplest way of applying them is just to use the label of one of the objects we're manipulating (of course, there are other things you could imagine doing, like always giving the same label to everything, but none of them seem to cover the facts very well).

This approach to tree building allows us to have intermediate levels of structure, smaller than XP but larger than X. We decided we wanted that, for two reasons. Consider (iv):

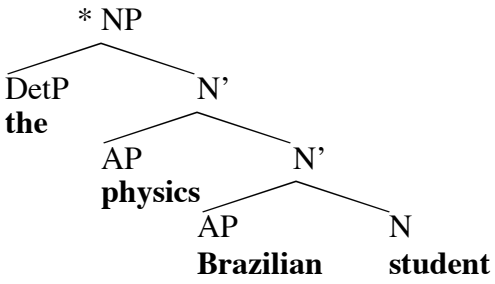
(iv)



We've decided that *Brazilian* is an **adjunct**, and *physics* is a **complement**; that is, *Brazilian* is the kind of adjective that could modify almost anything (*Brazilian doctor/lawyer/invention/law/history…*) whereas *physics* can only combine with a fairly small set of nouns (*physics student/professor/textbook/class*), and is therefore arguably **selected** by the head N *student* (that is, this N is listed in the lexicon as optionally taking a complement indicating the field of study). The syntactic distinction between complements and adjuncts is represented by a condition requiring complements to be sisters of the head that selects them; adjuncts, by contrast, can in principle go anywhere.

These conditions allow us to distinguish between (iv) and the ill-formed (v):

(v)



We correctly predict that complements will have to be closer to the head than adjuncts; in (v), the complement *physics* fails to be a sister of the selecting head N.

Our other tool for revealing the fine structure of the noun phrase is the pro-form *one*, which we decided substitutes for nominal projections consisting of the head and any complements:

(vi) the Brazilian physics student and the Venezuelan *one* (*physics student*)
(vii) this Brazilian physics student and that *one* (*Brazilian physics student*)
(viii) * the physics student and the chemistry *one* (*student*)

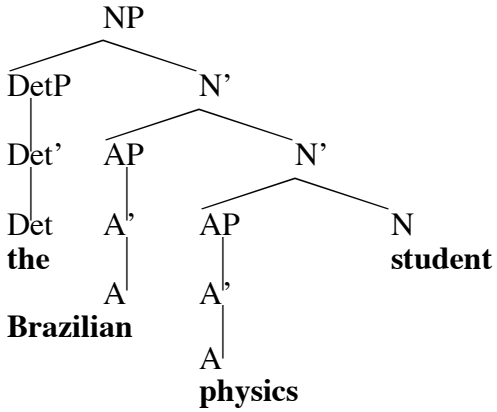
The last example is ill-formed, on this account, because *one* has replaced just the N *student*, failing to include the complement *physics*. We had similar arguments for the internal structure of the VP; one from relative ordering of complements and adjuncts, and another from the behavior of *do so*, which, like *one* in the NP, seems to stand in for a constituent of VP that includes V and its complements, if any.

For historical reasons, you should also know about **X-bar theory**, which resembles Bare Phrase Structure in that it replaces the very specific phrase structure rules that we saw at the beginning with a more general template (one which, like the Bare Phrase Structure theory, allows for intermediate bar levels); this is the theory that the Radford reading is discussing. The general template consists of three rules (order is irrelevant):

(5) XP→ (AP) X'
(6) X'→ (BP) X'
(7) X'→ (CP) X

These rules have the consequence that absolutely every head X must be dominated by at least one X', and on top of all the X's there is an XP. In the tree in (iv) above, for example, the projection of the head N conforms to the X-bar schema, but the DetP and the APs do not. To obey (5-7), the tree in (iv) would have to be changed to (iv'):

(iv')

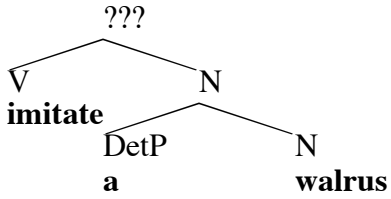


These nonbranching projections are forced by the X-bar theory, but they never seem to do us any good. Moreover, to those of us who are deeply enmeshed in Minimalist thinking, (5-7) seem a lot more arbitrary than Bare Phrase Structure. BPS basically says "You need a way of making complex structures out of atomic lexical items? Okay, take pairs of things and put them together to make bigger things, until you run out of things; then stop". The rules in (5-7) are a lot more specific than that, and hence more arbitrary; one could write equally simple rules that allowed projections to have two heads, or none.

Of course, because Bare Phrase Structure doesn't say much, the burden of making sure that labels project correctly and that heads take the right kinds of complements, etc. has to fall to other areas of the grammar. So far our focus has been on selection, which allows us to guarantee that (for instance) the verb *imitate* will have an NP complement, without having to write an independent phrase structure rule that specifically declares this to be an option for verbs.

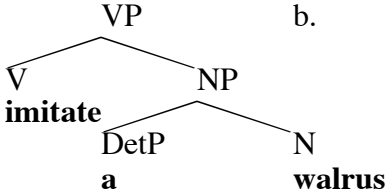
And as we saw in class, we might hope that selection will sometimes take care of correct label projection, too. Suppose we're Merging the V *imitate* with an NP *a walrus*:

(ix)

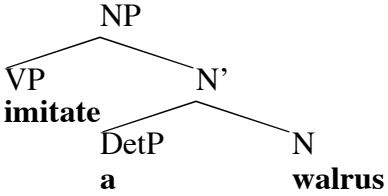


In principle, either V or N could project, giving you the possibilities in (x):

(x) a.



b.



But there are clearly problems with (b): the verb *imitate*, which selects for an NP sister, doesn't have one, and the N *walrus* has an adjunct VP *imitate*, which is going to be ruled out by conditions on how adjuncts are interpreted. In principle, we could posit an algorithm that always explains which of two labels ought to project ("when Merging a V and an N, project the V…"), but given that independent principles seem to doom the wrong choice here, maybe we don't need to bother coming up with such an algorithm.