

Phrase structure and clause structure

Introduction to Syntax, EGG 2011, Lecture 5

July 29th, 2011

1 The internal structure of phrases

Consider:

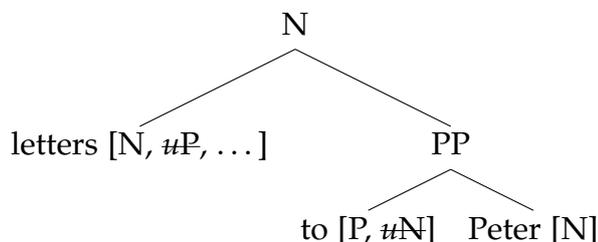
- (1) * letters to
- (2) letters [to Peter]

- *to* by itself is lacking something. It selects for an N but hasn't combined with one yet, so Merging it with *letters* is ungrammatical.
- But *to Peter* is complete, the [*uN*] selection feature on *to* having been checked, so it can Merge with *letters*.

Constituents like *to Peter*, which have checked all their uninterpretable features, are called **maximal** objects or **phrases**.

- A maximal object built around a noun is an NP, built around a P is a PP etc.

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Being Maximal depends on having no unchecked uninterpretable features.

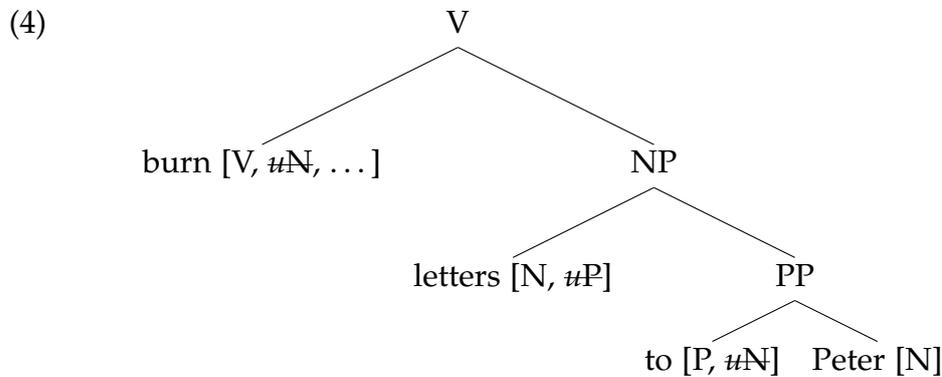
- ⇔ So there's nothing to stop something from being simultaneously Maximal and Minimal
- ☞ A simple lexical item with no selectional features, like *Peter*, will be both at the same time.

Note also that labeling a constituent as a PP or NP is just helpful notation and has no theoretical significance.

- ☞ The fact that an object is maximal is determined by its feature specification and nothing else.

1.1 Complements

A particular kind of structure arises when we Merge a simple lexical item with a category that it selects:



Peter is the **complement** of *to*, PP the complement of *letters*, NP the complement of *burn*...

The complement is the first thing to Merge with a head.

- ☞ It has nothing directly to do with linear order.
- ☞ So in many languages, complements come before heads:

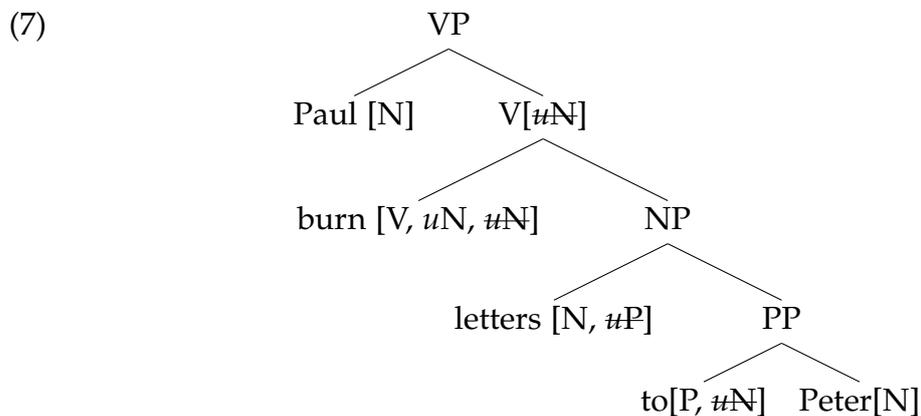
- (5) Hanako ga **Taro o** tataku (Japanese)
 Hanako nom Taro acc hit
 'Hanako is hitting Taro.'

We will (hopefully) discuss how to deal with this difference later in the course.

1.2 Specifiers

Something different happens when we add the subject:

- (6) Paul burns letters to Peter.



- *Paul* is selected here by one of the [*uN*] features on *burn*. But it doesn't Merge directly with *burn*.
- Instead, it Merges with a higher projection, after *burn* has already Merged with *letters to Peter*.
- The thing that *Paul* merges with is neither maximal nor minimal. We'll call it an **intermediate projection**, which we sometimes indicate as \bar{X} or X' , pronounced X-bar.

Something which is selected and Merges with an \bar{X} level projection is called a **specifier**.

1.3 Adjuncts

(8) Anson demonized David **every day**.

- *every day* doesn't seem to get a θ -role from *demonize* or from anything else.
- Instead of supplying necessary information, filling in a hole in a predicate, it gives extra information, modifying the proposition.

As such, *every day* is entirely optional, and could be left off or replaced by any number of other modifiers:

(9) Anson demonized David **at the club**.

(10) Anson demonized David **almost certainly**.

(11) Anson **very happily** demonized David.

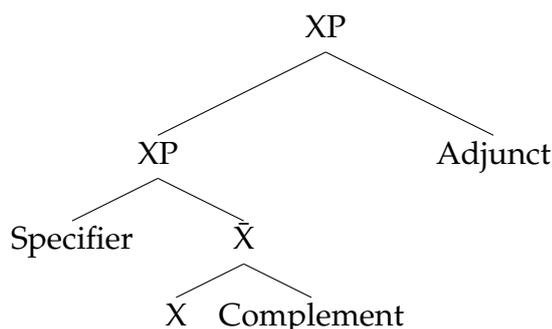
☞ We call such modifiers **adjuncts**.

Note that the concept of adjunct, like complement and specifier, is **not** about syntactic category.

- *every day* is an NP, *at the club* is a PP, and *almost certainly* and *very happily* are AdvPs.
- So just like we have a structural definition of complement and specifier, we'll need a structural definition of adjunct.

Here's the approach we'll take:

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- Adjuncts are sisters and daughters of phrasal nodes.
- This reflects the fact that no selectional feature is checked, and captures the fact that adjuncts are optional and recursive, i.e. you can have as many as you want.

Some evidence that adjuncts don't affect syntactic distribution:

- (13) Burn the letters (quickly)!
- (14) I burnt the letters (quickly).
- (15) I plan to burn the letters (quickly).
- (16) * Burn the letters (quickly) is the best thing to do.
- (17) Burning the letters (quickly) is the best thing to do.

Adjuncts raise a technical issue that we'll have to worry about:

- We said last time that the determination of the head when two items Merge – and hence what projects – is based on which object triggers Merge via its selectional feature.
- But adjunction doesn't involve selection, so our existing procedure won't work here.
- Clearly we want the object adjoined to – and not the adjunct – to project its features, but of course it can in no way be responsible for the adjunction operation.

There are a number of different ways to approach this issue, none of which is obviously better than the others, so at this point we won't propose anything that pretends to be insightful.

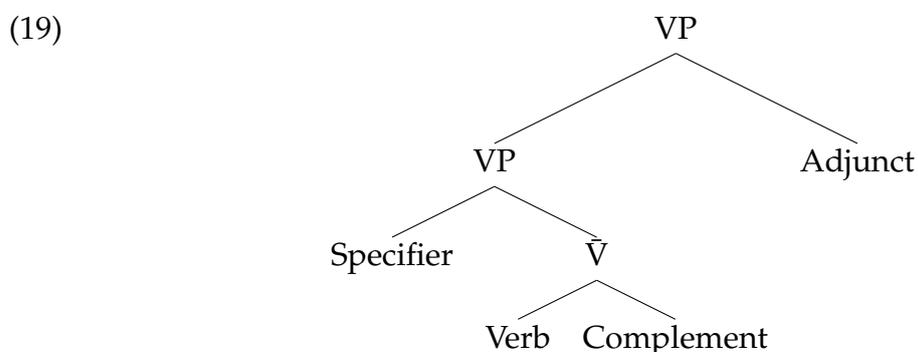
- Instead we'll simply stipulate that adjuncts are marked with a feature [Adjunct] – a plain admission that there is something we don't yet understand here.

- Then for completeness we can revise our definition of headedness, again with the ugly disjunctive formulation serving as an indication that we have work to do:

- (18) **Headedness** (revised) When two objects Merge, the object that will project its features to the newly created object is
- i. the one that selects the other, if selection is involved
 - ii. the one that does not bear an [Adjunct] feature, if selection is not involved.

1.4 The structure of VP

Here's how a full VP might look in our system:



This raises an issue:

- ☞ To derive such a VP with two arguments, the V would have to have two [*u*N] selectional features.
- ? But how would we make sure that the features get checked in the right order, i.e. how do we get the correct θ -roles to complement and specifier?

As usual, there are many ways we could proceed, and it is difficult to know in advance which approach will be correct.

- One approach would be to introduce a new mechanism to manage the θ -roles that lexical items carry and ensure that they are always assigned in the correct order.
- We will propose a solution which avoids adding any new mechanisms and allows us to maintain an extremely simple account of θ -role assignment, but adds complexity to the structure of the verb phrase.
- Ultimately, which of these approaches is superior will depend on what additional empirical coverage can be achieved with their respective additional complexities.

1.5 Introducing v

Our goal is to retain the following maximally simple version of θ -role assignment:

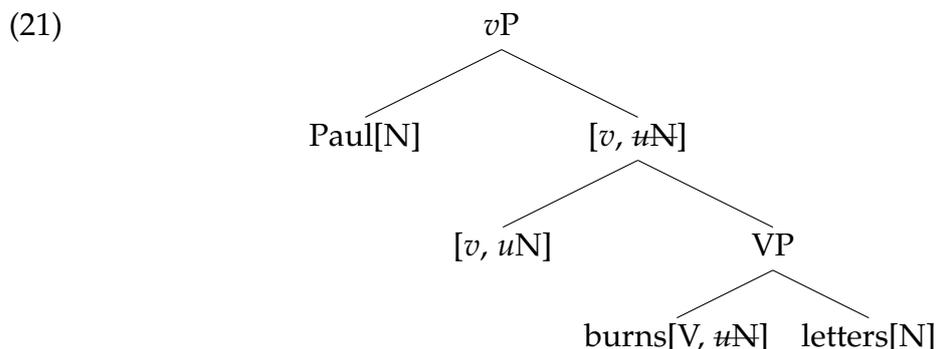
(20) **Blind θ -role assignment:** θ -roles are assigned blindly upon Merge of a θ -role assigner with an object of the correct syntactic category.

- I.e. θ -role assignment cares only about selection and the related categorial features.
- This means that, if a head selects two instances of the same category, there is no way to distinguish them in terms of θ -role.
- In turn, this essentially means that a single head should never select two instances of the same category.

So what do we do about transitive verbs?

- ☞ If we have two NPs getting θ -roles, and each head can only assign a θ -role to one instance of a particular syntactic category, then there must be two heads.
- ☞ I.e. we're going to propose that typical verbs actually involve two syntactic heads, one selecting the object, and the other selecting the subject.
- ☞ We'll continue to call the lower head V , and this is where we'll put the distinct lexical element, and we'll call the upper head v , pronounced 'little vee'.

Here's what a simple transitive transitive will look like then:



- *burns* has a uN feature, so it can Merge with the object *letters* and assigns to it its θ -role.
- v also has a uN feature. It first Merges with VP , projecting its features up to the next level, where it Merges with *Paul* and assigns to it its θ -role.

That solves the θ -role problem, but raises some new questions:

- ? What is the independent motivation for v ? Does it contribute anything else beyond the extra θ -role?
- ? What makes v Merge with V, and how do we determine that v should be the head rather than V?
- ? How does the v -V combination behave for purposes of pronunciation?

1.6 Motivating v

Consider first that basic constituency tests show that the object is closer to the verb than the subject is:

- (22) [Eat a mongoose] I never would
- (23) * [I/me eat] never would a mongoose
- (24) Dolores will [eat a mongoose] and I will [~~eat a mongoose~~] too.
- (25) * Will [you eat] a mongoose or will [~~you eat~~] a wolverine?

- ☞ Now, we can model this asymmetry by simply saying that the verb first Merges with the object and then the subject.
- ☞ But we again have no explanation for why that should always be the order if subject and object are symmetrical in both getting their θ -roles from the verb.
- ☞ On the other hand, if the subject gets its θ -role from a distinct head v which Merges with VP, we can explain the constituency facts rather than describing them.

There's also an asymmetry between subjects and objects when it comes to verbal semantics:

- (26) a. throw a baseball
b. throw support behind a candidate
c. throw a party
d. throw a fit
- (27) a. take a book from the shelf
b. take a bus to New York
c. take a nap
d. take an aspirin
e. take a letter in shorthand
- (28) a. kill a cockroach

- b. kill a conversation
- c. kill an evening watching TV
- d. kill a bottle
- e. kill an audience

What does all of that tell us?

- The choice of object can apparently affect the meaning of a verb in arbitrary ways.
- Note crucially that the effects here are not (all) straightforward idioms involving specific lexical items.
- E.g. the special meaning of *kill an evening* is available with any object with the right kind of semantics.
- This makes sense if the object really is an argument of the verb, since the semantics of the verb can be made sensitive to the semantics of its arguments.

Crucially, examples with similar effects based on the choice of subject are apparently lacking.

- ☞ The facts in 26–28 constitute an argument in favor of objects being arguments of the verb.
- ☞ Thus the lack of similar facts with subjects is an argument against them being arguments of the verb.
- ☞ If they are arguments of *v*, we can again account for the asymmetry.

1.7 Getting *v* together with V

So what regulates *v* Merging with V?

- The obvious possibility to consider would be that *v* also bears a [*u*V] feature, i.e. it selects for a V.
- Given our definition of headedness, this would ensure that it is *v* which projects after Merge and not V.

But there are some issues with such an approach:

- ☞ If *v* selects both for a V and for an N (i.e. the subject), what ensures that it Merges with V first?

- ☞ If the relevant uninterpretable features are only on v , this will ensure that v doesn't appear without V , but there's nothing to stop V showing up without v (and without a subject). I.e. something like 29 should be grammatical:

(29) * Burns letters.

We need a way to express the idea that the structure of a sentence built around a verb must have both v and V .

- We may ultimately be able to do this in terms of the right combination of selectional (and other uninterpretable) features localized to individual syntactic objects.
- Another possibility is that the requirement that both elements be present is not imposed by the syntax, but falls out of restrictions on semantic interpretation.
- But since it is not clear at this point how either of these solutions would work, we need something more direct.

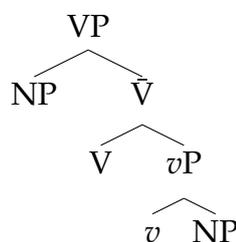
So we're going to propose a new component to our theory:

(30) **Hierarchy of Projections (preliminary)** $v > V$

- This says for now that whenever we have a v , it takes a VP complement. (We'll add more projections later.)
- The idea is that v is an extension of the projection of V , so they fit together as part of a single system.

The Hierarchy places a new restriction on structures, in addition to those placed by full interpretation etc. Structures like the following that don't respect it are ruled out:

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The HoP adds considerable complexity to our theory, and at this point it is a pure stipulation.

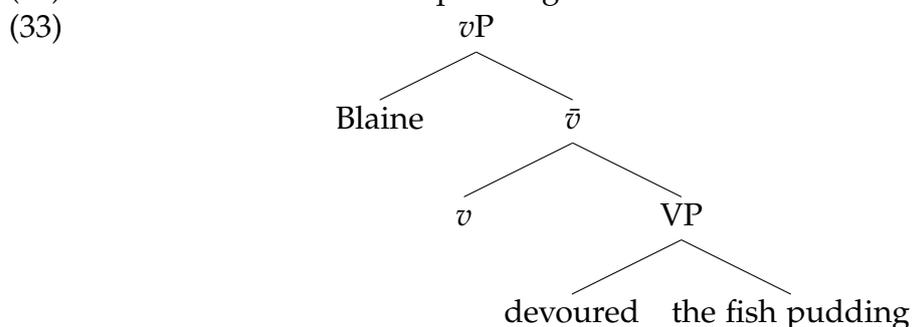
- Obviously, we will ultimately need to provide an explanatory basis for the hierarchy and justify the form it takes.

- Or we'll need to replace it with something more explanatory which can cover the same empirical ground.
- But for now, we need something to do this work, and the HoP is, if nothing more, a relatively simple stipulation, and should help to clarify what needs to be explained rather than concealing it.

2 Introducing T

So far we've motivated this much structure:

(32) Blaine devoured the fish pudding.



But there are some things we don't have a place for yet.

- Where does the suffix *-ed* on *devoured* come from?
- What do we do when we get an auxiliary verb like in 34 or even two like in 35, and how do we deal with the various forms of the verbs?

(34) Blaine must devour the fish pudding.

(35) Blaine must be devouring the fish pudding.

- Why does the subject always come first, even when this means it is separated from the verb that assigns it a θ -role?

(36) Blaine always devours his fish pudding.

2.1 Modals

Consider:

(37) Gilgamesh may seek Ishtar.

(38) # The stapler may seek Ishtar.

(39) The stapler may malfunction.

(40) # Gilgamesh may malfunction.

- *may* sits between the subject and the main verb.
- Yet it is the main verb that assigns the subject its θ -role.
- *may* modifies the meaning of the sentence, saying something about possibility.

A number of other **modal** auxiliaries show up in the same place with similar semantic contributions:

- (41) Gilgamesh **must** seek Ishtar.
 (42) Gilgamesh **can** seek Ishtar.
 (43) Gilgamesh **should** seek Ishtar.
 (44) Gilgamesh **will** seek Ishtar.

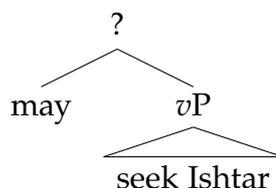
The modal is outside the VP constituent:

- (45) What Gilgamesh may do is [seek Ishtar].
 (46) ... and [seek Ishtar], Gilgamesh may

I.e. *may* Merges with the whole *vP*, not directly with the verb.

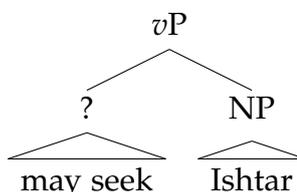
So we need

(47)



Not

(48)



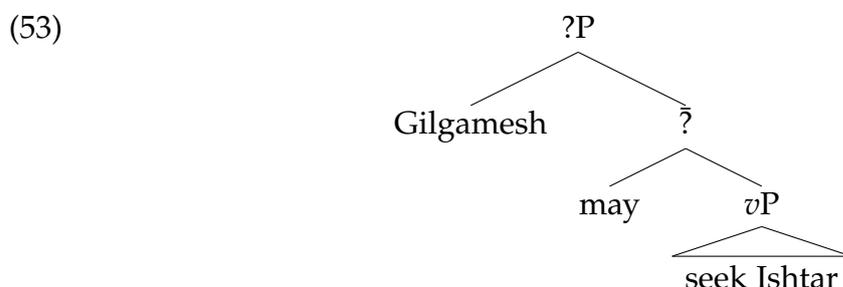
You can only have one modal per clause:

- (49) * Gilgamesh may must seek Ishtar.
 (50) * Gilgamesh must can find Ishtar.

There's nothing semantically amiss here. Compare:

- (51) Gilgamesh may have to seek Ishtar.
 (52) Gilgamesh must be able to find Ishtar.

So we seem to need something like this:



- A unique position for a modal auxiliary
- Between the surface position of the subject and the *vP*

The next thing to note about the modals is that they are like verbs in morphologically distinguishing present and past tense:

Present	Past
may	might
can	could
shall	should
will	would
must	

☞ Now, the alternations here are quite irregular, both in form and meaning, and *must* doesn't seem to have a corresponding past at all.

Still, **sequence of tense** facts suggest that this is tense, at least at a grammatical level:

- (54) I think she lives in Budějovice.
 (55) I thought she lived in Budějovice.
 (56) ?* I thought she lives in Budějovice.
 (57) I think she can speak Czech.
 (58) I thought she could speak Czech.
 (59) ?* I thought she can speak Czech.

Finally, note that it is always and only the modal that bears tense inflection. The main verb after it is always uninflected:

- (60) The Phillies could repeat.
 (61) * The Phillies could repeated.
 (62) * The Phillies can repeated.

2.2 Auxiliary *do*

do can be used to mark emphasis:

(63) Lucia **did** take my coffee.

Like with the modals:

- *do* appears between the subject and the main verb.
- *do* bears the tense inflection (and also the agreement).
- The main verb is uninflected.

(64) Lucia did take my coffee.

(65) Lucia does take my coffee.

(66) * Lucia did took my coffee.

(67) * Lucia do took my coffee.

Constituency tests again indicate that *do* – including its tense marking – is outside of *vP*:

(68) Lucia said that she took my coffee, and [take my coffee] she did.

(69) Lucia took my coffee, and Rory did [] too.

(70) Lucia likes coffee, and Rory does [] too.

- 69 and 70 are examples of **VP-ellipsis**.
- The whole VP (or rather *vP*) is deleted in the second clause, but the relevant form of *do* is left behind.
- So *do* is outside *vP*, and so is the locus of tense.

2.3 Infinitival *to*

An **infinitive** is a special type of clause which:

- Lacks inflection for tense and agreement
- Is usually embedded in a larger clause on which it is somehow dependent for aspects of its interpretation
- Often lacks an overt subject

In English, infinitival clauses have a *to* before the verb:

- (71) She tried [to leave].
 (72) We wanted [to eat cake].

Tense marking, modals and auxiliary *do* are all banned:

- (73) * She tried [to left].
 (74) * Sam hoped [to may leave].
 (75) * We wanted [to do eat cake].
 (76) * Sam hated to eat cake but Fran loved to do.

2.4 Positing T

Adding all of this up:

1. Modals and emphatic *do* appear in a special unique position.
2. This position is outside *vP* but below the surface subject position.
3. In infinitives, *to* appears in the same position instead.
4. The position, when filled, is the only place where tense marking can appear in the sentence.

⇒ This position is the syntactic realization of Tense.

So here's the structure we get:



- Modals, auxiliary *do* and infinitival *to* are different instantiations of a T head.
- T Merges with *vP* and projects TP, which hosts the subject in its specifier on the surface.
- Sentences are thus headed by Tense.

Now, the surface position of the subject presents a puzzle:

- ☞ We concluded previously that the subject is Merged in Spec-*vP*, because *v* assigns it its θ -role.
- ☞ But now we see that it actually shows up to the left of another head, T.

- ☞ Because selection requires sisterhood, we should never get a situation where something intervenes between a selecting head and the argument in its specifier.

We'll talk about how to deal with this next time.

T isn't quite like anything we've seen until now.

- It projects, but isn't involved at all in θ -role assignment.
 - The specific elements that realize it – the modals, *do* and *to* – constitute a closed class, unlike the open classes of nouns, verbs, adjectives and prepositions.
- ☞ We say that T is a **functional category**, while N, V, A and P are **lexical categories**.

v may also be a functional category. Like *v*, the position of T is regulated by the hierarchy of projections:

(78) **Hierarchy of Projections** $T > v > V$

2.5 Evidence from other languages

In some languages the status of tense as an independent head outside the VP is more transparent. E.g. Sranan (creole, Suriname) uses auxiliaries for marked tenses and aspects:

(79) mi waka
I walk
'I walk (habitually).'

(80) mi ben waka
I PAST walk
'I walked.'

(81) mi ben e waka
I PAST PROG walk
'I was walking.'

(82) mi ben o waka
I PAST PROSP walk
'I was about to walk.'

And in Hindi, most finite forms of most verbs are formed with a tense auxiliary (a form of 'be') separate from the main verb:

- (83) mĕ boltā hŭ
 I speak PRES
 'I speak.'
 (84) mĕ boltā t^hā
 I speak PAST
 'I spoke.'

3 Perf and Prog

English has two other special auxiliary verbs *have* and *be* which differ interestingly from both the modals and *do*.

- They can combine with modals and *to*, so they can't just be other instantiations of T:

- (85) I might have eaten some seaweed.
 (86) I expect to have finished by midnight.
 (87) I might be eating some seaweed.
 (88) I expect to be eating seaweed tomorrow.

- They can also combine with each other, in one particular order and no others:

- (89) I could have been flying helicopters by now.
 (90) *I could be having flown helicopters by now.
 (91) *I have could been flying helicopters by now.
 (92) *I am having could fly helicopters by now.

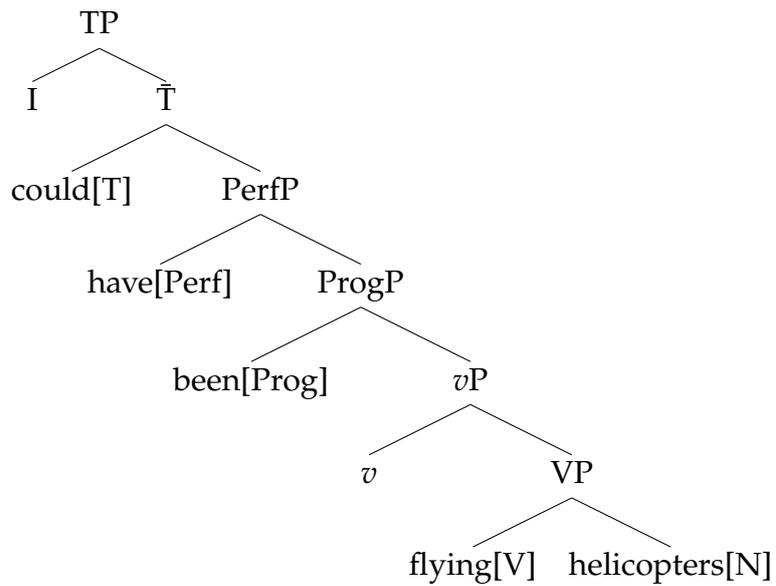
As for the structural positions of the auxiliaries:

- (93) I expected to have eaten the pizza, and [_{vP} eaten the pizza] I have.
 (94) I expected to be eating the pizza, and [_{vP} eating the pizza] I am.
 (95) I have been eating the pizza.
 (96) *I am having eaten the pizza.
 (97) Rory has [been eating pizza] and I have too.

- Both auxiliaries come outside the *vP* constituent.
- When they co-occur, *be* forms a constituent with *vP*, and *have* comes higher.

So we're going to introduce two new functional heads, Perf and Prog, to hold these two auxiliaries used to form the "perfect" and "progressive".

(98)



To get that order, we add our new friends to the Hierarchy:

(99) **Hierarchy of Projections** T > (Perf) > (Prog) > v > V

- ☞ Note that Perf and Prog are in parentheses to indicate that they are optional: all sentences have T and v and V, but not all sentences are perfects or progressives.