

Syntactic Theory 2

Week 13: Chomsky on Problems of Projection

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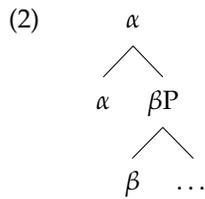
- The **Strong Minimalist Thesis** argues that language is the “perfect” solution to the representational requirements of the articulatory-perceptual system (AP) and the conceptual-intensional system (CI) – i.e., language is the natural way that we link sound and meaning, through some PF and LF representations
- The “faculty of language” in this sense is the (independently evolved existing) conceptual system and sound systems, plus Merge – the ability to combine words and phrases
- Syntax-internal phenomena, or phenomena that are not “virtually conceptually necessary”, are fundamentally problematic for this approach. These are things like: Case, agreement, movement¹, the ECP (=that-trace effect), and the EPP. These seem to be constraints that are internal to the syntax, and have little to do with semantics or phonology, and don’t follow from general computational principles
- In Chomsky (2013, 2016), we will try to pin these phenomena to “Labeling”, which we will try to independently motivate by appealing to locality of syntactic relations

1 Labeling

- Empirically, we see that phrases come in various kinds, and that their distribution is governed by their kind:
 - (1) a. Dale was told that [TP Sarah [TP [PST] [VP saw [DP Bob]]]]
 - b. It was Bob that Dale was told that Sarah saw ~~Bob~~
 - c. It was see Bob that Sarah did ~~see Bob~~
 - d. *It was saw Bob that Sarah ~~saw Bob~~
 - e. *It was Sarah saw Bob that ~~Sarah saw Bob~~
- To account for this, X’ theory stipulated that every phrase is a projection of some head, and thus has the same category as its head – i.e., there are TPs, CPs, VPs, vPs, DPs, etc, that project to the bar level and the phrase level from the head, T⁰, C, V, v, D, etc.

¹As we’ve discussed in class, Merge gives us “external Merge” and “internal Merge” – movement. However, this doesn’t explain why any words/phrases ever bother to move in the first place

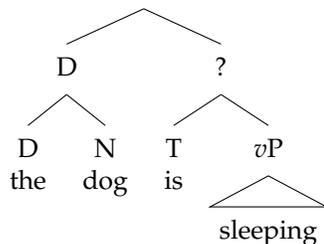
- Throughout most of Minimalism, we've also assumed that $\text{Merge}(\alpha, \beta)$ must yield a structure in which one of the two arguments is the "label" – Bare Phrase Structure is a literal interpretation of the idea that a head "projects" to the phrasal level by means of its label (cf. Hornstein 2009)
- Chomsky suggests that Merge need not have the property of labeling inherently. Instead, $\text{Merge}(\alpha, \beta)$ just outputs a phrase containing α and β .
- Then, there is a **Labeling Algorithm** that applies sometime after Merge. If α is a head and β is a phrase, then the structure is labeled α , because this head will be closer than the head of β from the perspective of higher probe.



- The more interesting problem is when we have two phrases that are merged together. Here are three common cases:

- (3)
- [? [DP subject] [TP T ...]]
 - [? [DP *wh*] [CP C ...]]
 - [? [DP subject] [_vP *v* ...]]

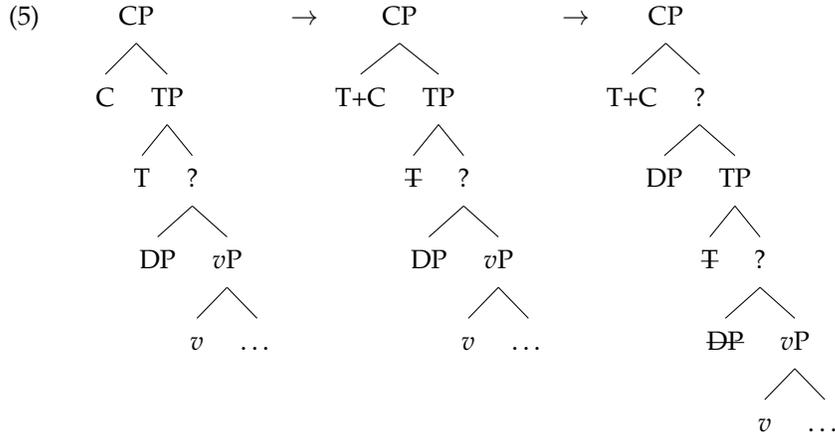
- We'll turn to each of these on a case-by-case basis.
- First, let's examine subjects. Without the label, should we say that this is a "left-branching" structure or a "right branching" structure? Is DP in Spec,TP, or is TP in Spec,DP? How do we know?



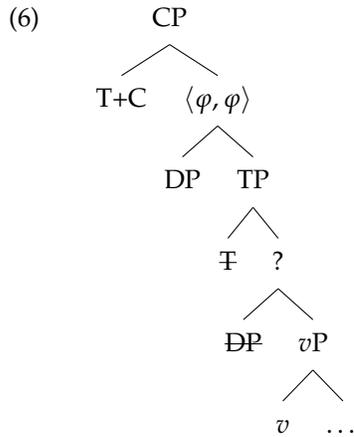
- We know that there is an asymmetrical relation here. For instance, we can extract an auxiliary out of the TP but not the DP. This is supposed to suggest that labeling is helpful for determining "minimal search".

- (4)
- Are eagles that swim **are** flying?
 - *Are eagles that **swimming** fly?

- For this reason, Chomsky (2013) suggests that T merges with C first, triggering C-to-T raising, and *then* the subject DP raises. However, it's unclear that this works once we make precise how the rest of the POP/POPE system works.

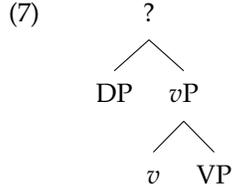


- Chomsky proposes that when two phrases Merge, if they Agree, then the label that they project is the set of shared features, which he represents as $\langle \varphi, \varphi \rangle$. Thus, when the subject DP gets to Spec,TP and agrees, that structure is now labeled:

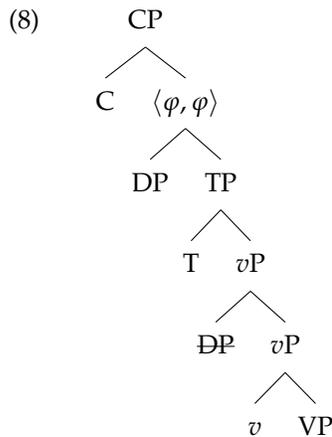


2 Motivating Movement

- Recall that we take the agent to be base merged with v , the syntactic head that both checks Accusative Case and assigns the Agent semantics. What is the label that projects when the agentive DP is merged with the vP?



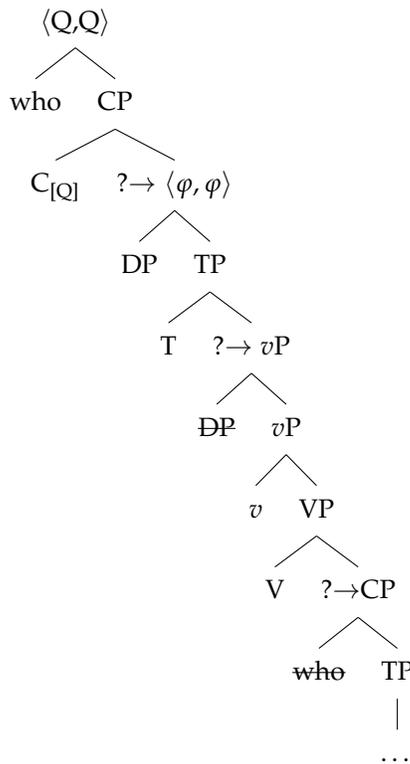
- Chomsky argues that the Agent DP does not Agree with the *v* – thus, the label cannot be the set of shared φ -features. For this reason, the DP is “repelled” from the *vP* to a higher position, and the *vP* can project its label.



- This implies that lower copies are invisible for the purposes of labeling.
- This also applies to successive cyclic movement. Previously, recall that we had to use the notion of “defective phase” to explain successive cyclicity – phases that Attracted a *wh*-phrase to its specifier without actually agreeing with it (Chomsky 2000, 2001):

- (9) a. who_[#F] did you think [_{CP} wh₀_[uF] C_[#F] Mary saw wh₀]
 b. *You thought who Mary saw

- On this analysis, the *wh*-phrase must pass through the edge of the phase, because staying in the “intermediate trace” position is unlabelable, as there’s no agreement between the moving *wh*-phrase and the phase head.
- The *wh*-phrase that ends up in a relation with a C_[Q] can label, because this is a kind of “agreement” – they both project their [Q] feature:

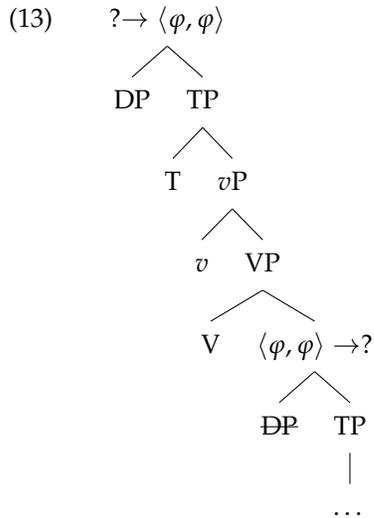


- If the *wh*-phrase stayed in the intermediate Spec,CP, then the $? \rightarrow CP$ phrase would have remained unlabeled, leading to ungrammaticality. Thus, the reason why subjects must vacate Spec,*vP* is the same reason why *wh*-phrases must vacate intermediate Spec,CP.
- **Question:** Does this resurrect Greed (cf. Bošković 2010)? Enlightened Self-Interest (Lasnik 1995)? Presumably, an object *wh*-phrase is labeling whichever structure objects surface in (more on this shortly), so what drives it to move to the specifier of the embedded phase, unless it “knows” it needs to label a higher $C_{[Q]}P$?
- It’s not clear why the **subject** must move from Spec,*vP*. Chomsky alludes to Moro’s (2000) “dynamic antisymmetry” analysis of copular constructions, wherein either a subject or a predicate can occur in the surface subject position. For Moro, this was because two merged XPs symmetrically c-command one another, thus leading to a linearization contradiction. Moving one XP was therefore necessary, although it didn’t matter which:
 - (10) a. [TP is [lightning] [the cause of the fire]]
 - b. Lightning is the cause of the fire
 - c. The cause of the fire is lightning
- Labeling analysis can also explain freezing effects:
 - (11) a. Dale is likely $\text{\textcircled{D}}$ ale to win

b. *Dale is likely Dale will win

- (12) a. Who did you think ~~who~~ saw Bob?
 b. *Who did you wonder ~~who~~ saw Bob?

- Suppose that labeling occurs at SpellOut/Transfer. That is, we get to label a phrase as $\langle \varphi, \varphi \rangle$ when the DP is in a “specifier” position at Transfer. If so, then, further movement will lead to an unlabeled structure:



Question: Before, we argued that in a structure [$? \text{ XP YP}$], moving XP allowed YP to project. Why is this impossible in this situation?

- Essentially, the idea is that agreement permits a DP to label a phrase, but the DP can only label a phrase in the surface position. Further movement leaves the lower phrase unlabeled, leading to ungrammaticality. Thus, movement will always proceed through non-agreeing positions, and then “freeze” in an agreeing position – exactly what we were trying to explain (cf. Rizzi 2006)

3 Raising to Object

- In GB, we analyzed the case of an ECM object as surfacing in the embedded Spec,TP, with its Accusative Case assigned from the higher VP:

(14) I consider [_{TP} him to be intelligent]

- However, Lasnik & Saito (1991) points out that the accusative-marked NP in these constructions scopes in the main clause. The adjunct PP here modifies the tense of the main clause, because

the embedded TP lacks tense, being non-finite. However, the object binds the anaphor in it, implying that the object is in the main clause, and can thus c-command into it:

(15) The lawyers [_{VP} proved the defendants_i [_{TP} ~~the defendants~~ to be guilty] [_{PP} during each others'_i trials]]

- To account for this, Lasnik & Saito (1991) propose that the object must raise to a higher projection. However, English isn't SOV – thus, the V must **also** raise to some higher projection:

(16) The lawyers [_{FP} proved [_{vP} the defendants [_{VP} ~~proved~~ [_{TP} ~~the defendants~~ to be guilty]]]] during each other's trials

- One possibility is that *v* checks the accusative Case of the object *in-situ* – however, we know that the object can scope over the subject. This is unexpected on this account, since QR is clause-bound:

(17) The lawyers proved each defendant to be guilty during some trial
 $\forall < \exists$
 $\exists < \forall$

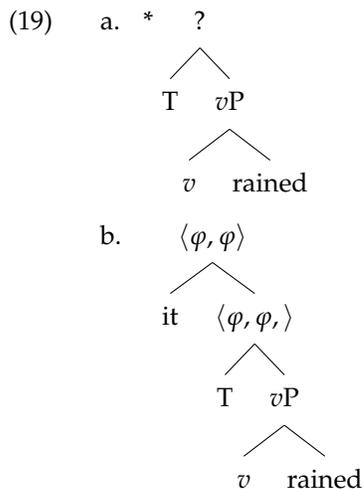
- Chomsky proposes that we can understand raising to subject (Spec,TP→Spec,VP) exactly on par with raising to subject (Spec,vP→Spec,TP), because non-finite T does not agree with its subject. Thus, the DP must vacate the embedded TP to a higher position – i.e., somewhere in the vP/VP domain (more on this later)

4 EPP and ECP

- Why do we observe the EPP in languages like English?

(18) a. *(It) seems to Dale to be dangerous.
 b. *(It) rained.
 c. *(There) appears to be a man behind the bed.
 d. *(It_{ExpI}) broke the glass

- Chomsky points out that we've already motivated that the subject must vacate the vP, but why do we need expletive subjects?
- Chomsky argues that T is too "weak" to label – that is, even when T merges with a vP, it cannot label it as a TP. Thus, the DP movement is necessary in order to provide a $\langle \varphi, \varphi \rangle$ label. This is supposed to derive the EPP:



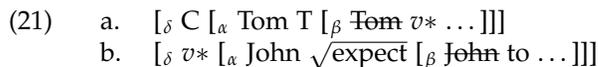
- **Question:** Does agreement really solve this issue? Or does the label need to transfer “downward” to the lower TP?
- Next, let’s examine why the ECP should hold. Intuitively, this is for the same reason why freezing is blocked – i.e., movement out of an agreeing position leaves the lowest phrase unlabeled, because neither T nor lower copies can label (by hypothesis).

(20) *Who did you say [_{CP} that [_{? who} likes Mary]]?

- Before giving a solution to this, Chomsky (2016) makes an analogy between raising to object and raising to subject. He has to crucially modify his assumptions about VPs, first:
- Chomsky supposes that lexical items do not inherently bear a category – instead, various heads (*v, n, a*, etc.) merge with “roots” – what he refers to as R. A noun, then, is what we call a *n* merged with a root, and a verb is what we call a *v* merged with a root, etc. (this is standard in Distributed Morphology, e.g., Marantz 1997)

- a. [_{nP} *n*_{tion} $\sqrt{\text{destroy}}$] → destruction
- b. [_{vP} *v*_Ø $\sqrt{\text{destroy}}$] → destroy
- c. [_{aP} *a*_{able} $\sqrt{\text{destroy}}$] → destroyable

- Furthermore, he supposes that roots – like T⁰ in English (but not in Italian – Rizzi 1982) are “weak”, and therefore cannot label. For that reason, roots must raise to *v*:



- Notice the departure from standard theories – here, the object is raising to Spec,VP (specifier of the root position), and the root is moving to *v** in order to be categorized². The object moves

²It is not clear that head raising is assumed in DM analyses of category labeling.

because it cannot agree with the non-finite T in an ECM construction, thus it is repelled, just like in subject-to-subject movement.

- This differs from the other analyses we've considered of object position, because there is no additional projection to host the V after the object moves, nor are we forced to say that accusative Case is assigned long-distance through Agree.
- Chomsky further suggests that the VP (α) in (21-b) is actually labeled $\langle \varphi, \varphi \rangle$, because of object "agreement" – Chomsky seems to be assuming that agreement and Case are different sides of the same coin, even when that Case and agreement is invisible (cf. Chomsky 2000, 2001; Bhatt 2005)
- **Question:** Does this predict that objects in non-ECM contexts do not raise? Or does Chomsky need to draw a distinction between different kinds of roots? Or, can the DP label directly upon merger with the V, even though in other contexts the Labeling Algorithm lets the head assign the label?
- Compare this with the same structures with an A'-movement from this position:

- (22) a. $[_\gamma \text{ who do you } v^* [_\epsilon \text{ think } [_\delta \text{ that/C}_\emptyset [_\alpha \text{ who T } [vP]]]]]$
 b. $[_\gamma \text{ who do you } v^* [_\delta v^* [_\alpha \text{ who } \sqrt{\text{expect}} [TP \text{ who to } \dots]]]]$

- In this system, we expect the ungrammaticality of subject raising to be the norm. That is, disturbing the labeling of a TP by raising the *wh*-subject to a CP position should result in ungrammaticality. Similar points make for extraction of an (ECM)-object. Thus, the question now isn't "why can't I extract a subject *wh*-question over a complementizer?", but rather "why can I extract a subject *wh*-question over a null complementizer?" and "why can I ever extract an object?"
- Chomsky first tackles the first question – why should null C ever allow movement? He proposes the following order of operations:

- (23) Order of operations:
- Inheritance (C passes its features to T)
 - Internal Merge (EPP; the subject DP moves to merge with TP)
 - Labeling (DP and TP project the label of their share φ -features)
 - C deletes – i.e., becomes "invisible"
 - Transfer

- (24) $[_{CP} C_{[\varphi, Q]} [_{TP} T [? DP [vP \dots]]]]$
- $[_{CP} C [_{TP} T_{[\varphi, Q]} [? DP [vP \dots]]]]$
 - $[_{CP} C [? DP [_{TP} T_{[\varphi, Q]} [? \text{DP} [vP \dots]]]]]]$
 - $[_{CP} C [\langle \varphi, \varphi \rangle DP [_{TP} T_{[\varphi, Q, \text{phase}]} [? \text{DP} [vP \dots]]]]]]$
 - $[_{CP} \emptyset [\langle \varphi, \varphi \rangle DP [_{TP} T_{[\varphi, Q]} [vP \text{DP} [vP \dots]]]]]]$
 - $[_{CP} \emptyset [\langle \varphi, \varphi \rangle DP [_{TP} T_{[\varphi, Q]} [vP \text{DP} [vP \dots]]]]]]$

- Chomsky proposes that null complementizers don't really exist. When they get "deleted", they are actually removed from the structure – i.e., there is no more CP. The TP then becomes the

phase, since it inherited all of C's features before deletion. Thus, what's spelled-out with null Cs is not the TP, but rather the *v*P.

- Now, the subject and the labeled TP are no longer spelled out, so the DP is accessible to higher operations in the next phase. Crucially, Chomsky proposes that once a phrase is labeled, it can't be "unlabeled" by further movements, because phases have "memory". Thus, movement of the subject to the next CP position is acceptable. This does not occur when C does not delete, however. Grey text indicates to Transferred material:

- (25) a. [_(Q,Q) who [_{CP} did you say [_(φ,φ) ~~who~~ [_{TP} T saw Bob]]]]
 b. *[[_(Q,Q) who [_{CP} did you say [_{CP} ~~who~~ C [_{? who} [_{TP} T saw Bob]]]]]]

- The problem with the *that*-trace construction then is that (1) either we are moving the *wh*-phrase from the Transferred Spec,TP position, OR (2) we move from the Spec,TP position to the phase edge before spell-out, meaning that the TP is unlabeled.
- Now, why are objects ever movable? Recall that verbs are presumed to be roots that must move. Chomsky suggests that when the root moves up to *v** to get categorized, this in effect deletes the *v**, and thus the *v**P phase – now VP becomes the phase, because it inherits its features from *v*P, triggering Transfer of the TP. Instead, the conglomeration of the root and the *v** projects, because the root is now "strong". The object is now free to move to a higher position, because that will be internal to the next highest phase.

- a. [_(Q,Q) who [_{CP} did you [_{√*expect*+*v*P} $\sqrt{\text{expect}+v^*}$ [_(φ,φ) ~~who~~ [_(φ,φ) ~~expect~~ [_{TP} ~~who~~ [_{TP} to ...]]]]]]]

- **Question:** Does this imply that *v** is in fact **never** a phase head? That is, a root will always move and attach to a *v**, thereby making it "invisible".

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