Syntactic Theory 2
Week 7: Phase Theory

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- The grammar consists of a Numeration (an array of lexical items that will be Merged during the course of the derivation) and the operation Merge, which builds phrase structure by iteratively checking features from the lexical items
- At various points in the derivation, the operation Spell-Out (or **Transfer**) ships a copy of the derivation to PF and LF (e.g., Uriagereka 1999)
- Movement is trigged by an additional operation **Agree**. Agree allows a head to probe its c-command domain for a lexical head that matches its features, and then checks its features long-distance. Afterwards, if there is an EPP feature, then a copy of the lower phrase merges at the root.
- However, we know that there many operations are domain-constrained:

  (1) a. John believes [$_{TP}$ himself to be nice]
  b. *John expects [$_{TP}$ Mary to like himself]

  (2) a. Who did you say [$_{CP}$ that Mary likes ~~who~~]?
  b. *Who did you wonder [$_{CP}$ whether Mary likes ~~who~~]?

- In this lecture, we will introduce a more systematic way to understand the points in the derivation where Spell-Out occurs, and we will work (towards) a general theory of domains, called **phase theory**

1 Merge Over Move

- Chomsky (1995) proposes that there's an Economy preference **Merge Over Move**, which says that the derivation prefers to Merge from the Numeration before Moving things internal to the tree
- For Chomsky, this was because he first proposed that Move = Copy+Merge; however, we can understand Chomsky's intuition that Move is "less economical" if Move = Agree+Merge

  (3) a. There are likely to be many cats on the mat

b. *There are likely many cats to be on the mat

(4) Numeration: {C, there, are, likely, to, be, many, cats, on, the, mat}

(5)
Merge =	$[_{VP}$ be $[_{PP}$ many cats $[_{PP}$ on the mat]]]
Merge(to, VP) =	$[_{TP}$ to $[_{VP}$ be $[_{PP}$ many cats $[_{PP}$ on the mat]]]]
Move(many cats, TP) =	$[_{TP}$ many cats $[_{TP}$ to $[_{VP}$ be $[_{PP}$ ~~many cats~~ $[_{PP}$ on the mat]]]]]
Merge(likely, TP) =	$[_{AdjP}$ likely $[_{TP}$ many cats $[_{TP}$ to . . .]]]
Merge(are, AdjP) =	$[_{TP}$ are $[_{AdjP}$ likely $[_{TP}$ many cats $[_{TP}$ to . . .]]]]
Merge(there, TP) =	$[_{TP}$ there $[_{TP}$ are $[_{AdjP}$ likely $[_{TP}$ many cats $[_{TP}$ to . . .]]]]]
Merge(C, TP) =	$[_{CP}$ C $[_{TP}$ there $[_{TP}$ are $[_{AdjP}$ likely $[_{TP}$ many cats $[_{TP}$ to . . .]]]]]

(6)
Merge =	$[_{VP}$ be $[_{PP}$ many cats $[_{PP}$ on the mat]]]
Merge(to, PP) =	$[_{TP}$ to $[_{VP}$ be $[_{PP}$ many cats $[_{PP}$ on the mat]]]]
Merge(there, TP) =	$[_{TP}$ there $[_{TP}$ to $[_{VP}$ be $[_{PP}$ many cats $[_{PP}$ on the mat]]]]]
Merge(likely, TP) =	$[_{AdjP}$ likely $[_{TP}$ there $[_{TP}$ to . . .]]]
Merge(are, AdjP) =	$[_{TP}$ are $[_{AdjP}$ likely $[_{TP}$ there $[_{TP}$ to . . .]]]]
Move(there,TP) =	$[_{TP}$ there $[_{TP}$ are $[_{AdjP}$ likely $[_{TP}$ ~~there~~ $[_{TP}$ to . . .]]]]]
Move(C,TP) =	$[_{CP}$ C $[_{TP}$ there $[_{TP}$ are $[_{AdjP}$ likely $[_{TP}$ ~~there~~ $[_{TP}$ to . . .]]]]]

- However, this can't be general, because there are cases where a DP moves before a higher expletive is Merged:

(7) a. There is $[_{DP}$ a strong likelihood $[_{CP}$ that many cats are ~~many cats~~ on the mat]]
b. *There is $[_{DP}$ a strong likelihood $[_{CP}$ that ~~there~~ are many cats on the mat]]

- Chomsky's (2000, 2001) proposal – the Numeration is split into subdomains, and we first Merge all lexical items in one subarray before moving onto the next:

(8) Numeration: { {there, is, a, strong, likelihood}, {many, cats, are, on, the, mat} }

2 Phase Theory

- Let C and v be **phase heads**. Upon completing the CP and the vP, the complement of the phase head (= TP, VP) are **Transferred** (= Spelled-Out) to the interfaces

(9) Numeration: { {C, T} {v, Ernie, chased, Frisky} }

(10)
Merge(chased, Frisky) =	$[_{VP}$ chased Frisky]
Merge(v, VP) =	$[_{vP}$ v $[_{VP}$ chased Frisky]]
Merge(Ernie, vP) =	$[_{vP}$ Ernie $[_{vP}$ v $[_{VP}$ chased Frisky]]]
Transfer VP =	$[_{vP}$ Ernie $v]$
Merge(T, vP) =	$[_{TP}$ T $[_{vP}$ Ernie $v]]$
Merge(Ernie, TP) =	$[_{TP}$ Ernie $[_{TP}$ T $[_{vP}$ ~~Ernie~~ $[_{vP}$ v]]]
Merge(C, TP) =	$[_{CP}$ C $[_{TP}$ Ernie $[_{TP}$ T $[_{vP}$ ~~Ernie~~ $[_{vP}$ v]]]]

Transfer TP = [$_{CP}$ C]

- Why are C and *v* phase heads? Propositional completeness? Points in the derivation where all features are checked?
- One idea that's currently being pursued: **all** features are checked at the phase head, i.e., all uninterpretable features are introduced and then checked at C and *v*

(11) **Phase Impenetrability Condition** (PIC): In phase HP with head H, the domain of H is not accessible to operations outside HP, only H and its edge (= specifier) are accessible to such operations (Chomsky 2000)

- After an XP has been transferred, it's inaccessible to other operations, because it's being phonologized or semanticized
- This explains why movement targets specifier positions and why movement is successively cyclic –

(12) **Subjacency**: An XP can't move over two bounding nodes (= TP, DP) in one movement

(13) a. Who did you say [$_{CP}$ ~~who~~ that [$_{TP}$ Mary thinks [$_{CP}$ ~~who~~ that [$_{TP}$ Sue likes ~~who~~]]]]?
b. Who did you wondered [$_{CP}$ whether [$_{TP}$ Mary thinks [$_{CP}$ ~~who~~ that [$_{TP}$ Sue likes ~~who~~]]]]?

(14) Who (all) did you (all) say (all) Mary (all) likes ~~who all~~?

(15) Rām-ne kyā kahā ki Sītā-ne kyā socā ki Ahmad kahā gayā hai
Ram-ERG what said that Sita-ERG what think that Ahmad where went T
'Where did Ram say that Sita thought that Ahmad went?'

- In Phase Theory, the *wh*-phrase has to target each phase edge, otherwise it will be Transferred out
- With our current assumptions, we have to say that *wh*-phrases ALSO target Spec*v*P positions:

(16) wh . . . [$_{CP}$ ~~wh~~ . . . [$_{vP}$ ~~wh~~ . . . [$_{CP}$ *wh*. . .]]]

- However, the "weak" PIC might not force successive cyclicity to target intermediate *v*Ps for *wh*-movement:

(17) **Phase Impenetrability Condition** (Weak Version): In phase HP with head H, the domain of H is not accessible to operations at the next phase head ZP, only H and its edge (= specifier) are accessible to such operations (Chomsky 2000)

- Long-distance Agree is considered problematic for the strong version of the PIC:

(18) a. Henni höfðu leiðst þeir
her.DAT had.3.PL bored they.NOM

'They find her boring' (Icelandic, Sigurðsson 2002)

b. There arrived a train

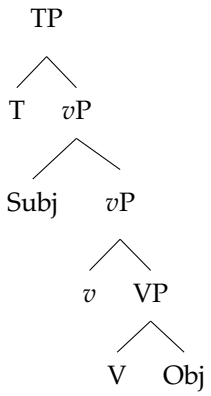
(19) [$_{TP}$ höfðu [$_{vP}$ v [$_{VP}$ leiðst þeir]]]

- The object has to be active in the derivation by the time the T is merged, so the vP can't immediately spell out the VP until the CP phase is completed

3 TP?

- Subjacency relied on TP being a bounding node. Are TPs phases?

(20)



- T wouldn't be able to probe the object if TP is also a phase, even if we accept the "weak PIC"
- Additionally, CP and vP are "units" for many syntactic operations, but TP isn't:

(21) a. John said that Mary went to the store, and Jane did [$_{vP}$ said [$_{CP}$ that [$_{TP}$ Mary went to the store]]] too.

b. John said that Mary went to the store, and Jane did [$_{vP}$ ~~said [$_{CP}$ that [$_{TP}$ Mary went to the store~~]]] too.

c. *John said that Mary went to the store, and Jane [$_{vP}$ said [$_{CP}$ that [$_{TP}$ ~~Mary went to the store~~]]] too.

d. ?John said that Mary went to the store, and Jane did [$_{vP}$ said so [$_{CP}$ ~~that [$_{TP}$ Mary went to the store~~]]] too.

(22) a. John [$_{vP}$ said [$_{CP}$ that [$_{TP}$ Mary is nice]]]

b. [$_{vP}$ said that Mary is nice], John did

c. [$_{CP}$ that Mary is nice], John said

d. *[$_{TP}$ Mary is nice], John said that

- However, TP is what assigns Nominative Case, triggers agreement with the subject, hosts the verb (and possibly negation sometimes). Thus, TP seems to be a problem if we want to understand phases as the units in which all operations apply

- How might we fix this? Richards (2008) proposes that C^0 comes with all its features, and T^0 "inherits" its features from C. Thus, T probes its c-command domain *after* C is merged, i.e., at the CP-phase

(23)
Merge(T,*v*P) =	$[_{TP}$ T $[_{vP}$ John likes Mary]]
Merge(C,TP) =	$[_{CP}$ $C_{[\varphi]}$ $[_{TP}$ T $[_{vP}$ John likes Mary]]]
Feature Inheritance =	$[_{CP}$ C $[_{TP}$ $T_{[\varphi]}$ $[_{vP}$ John likes Mary]]]
Agree and Move =	$[_{CP}$ C $[_{TP}$ John $T_{[\varphi]}$ $[_{vP}$ ~~John~~ likes Mary]]]

- Motivation for Feature Inheritance comes from a few places. For one, subject *wh*-questions often display different behavior than other *wh*-questions:

(24) a. $[_{CP}$ Who $[_{TP}$ ~~who~~ left]]?
b. *Who did leave?

(25) a. Que est-ce que tu as vu?
What Q that you have seen
'What did you see?' (French)
b. Qui est-ce qui t' a vu?
Who Q that have you have seen
'Who has seen you?' (French)

- This might be explained if we think that in these cases the *wh*-feature is also passed to T. We'll read another view by Fox & Pesetsky on why subject *wh*-questions might show different behavior in the next section of the course.

- Additionally, we find cases where complementizers overtly show agreement. In these languages, we might think that C^0 is probing for φ-features:

(26) a. Kpeinzen dan-k morgen goan
I think that-AGR tomorrow go
'I think that I'll go tomorrow' (West Flemish; Carstens 2005)
b. Alfredi kabolela babandu ali bakhakhile
Alfred.1 said.1 people.2 that.1 will conquer.2
'Alfred told the people that they will win' (Lubukusu, Diercks 2011)

- This raises a problem – subject movement is now counter-cyclic, i.e., it violates the Extension Condition. Chomsky's (2001) solution is to propose that all operations happen "simultaneously" at the phase level, i.e., there is no rule-ordering at the phase level.

- Perhaps this is independently necessarily. Consider the case of *wh*-object movement:

(27)
Merge(chase,who) =	$[_{VP}$ chase who]
Merge(*v*,VP) =	$[_{v}$ $[_{VP}$ chase who]]
Merge(Ernie, *v*P) =	$[_{vP}$ Ernie $[_{vP}$ $[_{VP}$ chase who]]]
Move(who, *v*P) =	$[_{vP}$ who $[_{vP}$ Ernie $[_{vP}$ *v* $[_{VP}$ chase ~~who~~]]]]

Transfer =	$[_{vP}$ who $[_{vP}$ Ernie $[_{vP}$ $v]]]$
Merge(T, vP) =	$[_{TP}$ T $[_{vP}$ who $[_{vP}$ Ernie $[_{vP}$ $v]]]]$
Merge(C, TP) =	$[_{CP}$ $C_{[\varphi]}$ $[_{TP}$ T $[_{vP}$ who $[_{vP}$ Ernie $[_{vP}$ $v]]]]]$
FI =	$[_{CP}$ C $[_{TP}$ $T_{[\varphi]}$ $[_{vP}$ who $[_{vP}$ Ernie $[_{vP}$ $v]]]]]$
Agree & Move =	$[_{CP}$ C $[_{TP}$ Ernie $T_{[\varphi]}$ $[_{vP}$ who $[_{vP}$ ~~Ernie~~ $[_{vP}$ $v]]]]]$
Agree & Move =	$[_{CP}$ who C $[_{TP}$ Ernie $T_{[\varphi]}$ $[_{vP}$ ~~who~~ $[_{vP}$ ~~Ernie~~ $[_{vP}$ $v]]]]]$

- Two problems arise here – for one, the object moves over the subject. Secondly, T agrees with the subject over the object. Additionally, the object moves over the lower copy of the subject, which may be problematic. It's unclear that any of this should be possible.
- Recall that typically subjects and objects block operations –

(28) a. *John likes Mary $[_{vP}$ ~~Mary~~ likes ~~John~~]
b. *John seems that Mary is likely to ~~John~~ know ~~Mary~~

- Chomsky (1995) pre-saged that this would be a problem, and "solved" it by arguing that subjects and objects in particular configurations are **equidistant**. However, if all operations occur "simultaneously", then this shouldn't be a problem. (I also think that this requires a weak PIC)

(29)

Merge(vP) =	$[_{vP}$ Ernie $[_{VP}$ chase who]]
Merge(CP) =	$[_{CP}$ $C_{[\varphi]}$ $[_{TP}$ T $[_{vP}$ Ernie $[_{VP}$ chase who]]]]
FI =	$[_{CP}$ C $[_{TP}$ $T_{[\varphi]}$ $[_{vP}$ Ernie $[_{VP}$ chase who]]]]
Move =	$[_{CP}$ ~~who~~ C $[_{TP}$ Ernie $T_{[\varphi]}$ $[_{vP}$ ~~who~~ ~~Ernie~~ $[_{VP}$ chase ~~who~~]]]]

- In effect, this implies that the phase heads control all the computations of the grammar, and Merge+EC is not necessarily the theory of cyclicity; instead, it implies that the grammar assembles phases as distinct workspaces. It also seems to imply a much more "representational" view of the grammar

Bibliography

Chomsky, Noam. 1995. *The Minimalist Program*. Cambridge: MIT Press.

Chomsky, Noam. 2000. Minimalist Inquiries: The Framework. In R. Martin, D. Michaels, & J. Uriagereka (eds.) *Step by Step: Essays in Minimalist Syntax in Honor of Howard Lasnik*, 89–155. Cambridge: The MIT Press.

Chomsky, Noam. 2001. Derivation by Phase. In M. Kenstowicz (ed.) *Ken Hale: A Life in Language*, 1–52. Cambridge: MIT Press.

Diercks, Michael. 2011. Against Feature Inheritance: Phase Heads Are Not Defined by Unvalued ϕ-Features. Ms.

Richards, Marc D. 2008. On Feature Inheritance: An Argument from the Phase Impenetrability Condition. *Linguistic Inquiry* 24(3), 563–572.

Sigurðsson, Halldór 'Armann. 2002. To be an oblique subject: Russian vs. Icelandic. *Natural Language and Linguistic Theory* 20, 691–724.

Uriagereka, Juan. 1999. Multiple Spell-Out. In S.D. Epstein & N. Hornstein (eds.), *Working Minimalism*, 251–282. Cambridge: MIT Press.