Class 2: Is CP a phase?

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1 CP as a phase

- In the last class, we took Chomsky (2000) suggestion that CP and *v*P constitute phases more or less at face value.
- In this class, we will examine the evidence for CP being a phase a little more closely.
- One major prediction of assuming that CP is a phase, is that movement out of CP should stop at Spec-CP due to the PIC.

(1) *Successive-cyclic movement via CP*:
[$_{CP}$ Who do you say [$_{CP}$ ___ that Mary thinks [$_{CP}$ ___ that [$_{TP}$ John likes ___]]]] ?

- Recall from the last class that we proposed the following general diagnostics for successive-cyclic movement:

(2) *Diagnostics for successive-cyclic movement*:
   a. *Intermediate pronunciation*:
   Can (part of) a moving phrase be pronounced at an intermediate landing site?
   b. *Intermediate interpretation*:
   Can a moving phrase be interpreted at an intermediate landing site?
   c. *Intermediate licensing*:
   Do certain licensing properties of a moved item hold at an intermediate landing site?

- Furthermore, we might expect to find evidence from the interfaces (LF and PF) that points to the phasehood of CP.

2 A brief history of successive-cyclic movement

- Sometimes the way phases are presented suggests that successive-cyclic movement is an accidental by-product of cyclic computation.
- However, the idea of successive-cyclic movement is an old one that has it roots in the *Subjacency Condition*:

(3) *Subjacency* (Chomsky 1977:73):
A phrase cannot move from position Y to position X in
… X … [$_{\alpha}$ … [$_{\beta}$ … Y …] …] … X …,
where α and β are cyclic nodes [= DP, TP].

- This was designed to derive Ross' (1967) island conditions such as the CNPC (4a). However, it ended up being too strong in ruling out long-distance wh-movement too (4b).

(4) a. [$_{CP}$ Who$_1$ did you meet [$_{\underline{DP}}$ the man [$_{CP}$ that [$_{\underline{TP}}$ Mary [$_{vP}$ likes ___$_1$]]]]]
   b. [$_{CP}$ Who$_1$ do [$_{\underline{TP}}$ you think [$_{CP}$ that [$_{\underline{TP}}$ Mary [$_{vP}$ likes ___$_1$]]]]]

- The way around this was to posit an intermediate 'touch-down' in Spec-CP of the embedded clause. Now, each moving step only crossing one cyclic/bounding node.

(5) [$_{CP}$ Who$_1$ do [$_{\underline{TP}}$ you think [$_{CP}$ ___$_1$ that [$_{\underline{TP}}$ Mary [$_{vP}$ likes ___$_1$]]]]]

- Movement to the edge was also hard-wired into other theories pre-dating Minimalism.
- Abels (2003) points out the striking similarty between the PIC (6) and van Riemsdijk's (1978) *Head Constraint* (7).

(6) *Head Constraint* (van Riemsdijk 1978:169):
No rule may involve X_i (X_j) and Y in the structure
… X_i … [α … Y …] … X_j … if Y is c-commanded by the head of α;
α ranges over V, N, A, P.

- This created the notion of an 'escape hatch' at Spec-YP, since Y will not c-command α in Spec-YP.
- Thus, the idea of successive-cyclic movement has been around for a long time. A lot of the evidence supporting successive-cyclic movement via Spec-CP pre-dates Phase Theory.

3 Evidence for successive-cyclicity at CP

3.1 Intermediate pronunciation

3.1.1 Wh-copying

- It has been argued that several languages can pronounce a moved phrase in an intermediate position:

(7) *Wh-phrases pronounced in intermediate positions*:

a. *Wen* meint Karl [$_{CP}$ *wen* wir ___ gewählt haben] ?
who thinks Karl who we elected have
'Who does Karl think we have elected?' (*German*; Höhle 2000:257)

b. *Wer* tinke jo [$_{CP}$ *wer*-t Jan wennet ___] ?
where think you where-that Jan lives
'Where do you think Jan lives?' (*Frisian*; Hiemstra 1986:99)

c. *Tayuwe* kt-itom-ups [$_{CP}$ *tayuwe* apc k-tol-i malsanikuwam-ok ___] ?
when 2-say-DUB when again 2-there-go store-LOC
'When did you say you're going to go to the store?'
(*Passamaquoddy*; Bruening 2006:26)

- Under the Copy Theory of Movement (Chomsky 1995), this follow seems to follow naturally:

(8) [$_{CP}$ Who do you think [$_{CP}$ ⟨who⟩ that Mary likes ⟨who⟩]]] ?

Problem:

For German, it is not quite so simple as 'pronounce the intermediate copy' (Murphy 2016).

If we remove the intermediate copy, the sentence is ungrammatical (9b)

(9) a. *Wen* meint Karl [$_{CP}$ *wen* [$_{TP}$ wir ___ gewählt haben]] ?
who thinks Karl who we elected have
'Who does Karl think we have elected?'

b.* *Wen* meint Karl [$_{CP}$ ___ [$_{TP}$ wir ___ gewählt haben]] ?
who thinks Karl we elected have
'Who does Karl think we have elected?'

- Long distance extraction requires that the verb moves from T-to-C in German:

(10) a. *Wen*$_1$ meint Karl [$_{CP}$ ___ [$_{C^0}$ haben] [$_{TP}$ wir ___$_1$ gewählt ___$_T$]] ?
who thinks Karl have we elected
'Who does Karl think we have elected?'

b.* *Wen*$_1$ meint Karl [$_{CP}$ *wen* [$_{C^0}$ haben] [$_{TP}$ wir ___$_1$ gewählt ___$_T$]] ?
who thinks Karl who have we elected
'Who does Karl think we have elected?'

- Something has to block T-to-C movement if an intermediate copy is realized, but it is relatively unclear what that should be (this clearly cannot be the Doubly-Filled COMP Filter; Chomsky & Lasnik 1977; Bayer 1984).

3.1.2 Resumption

- In Seereer, resumptive pronouns surface in intermediate Spec-CP positions.

(11) *Intermediate resumption at Spec-CP in Seereer* (Baier 2014):

a. Xar$_1$ foog-o [$_{CP}$ yee **ten**$_1$ Yande a lay-u [$_{CP}$ yee **ten**$_1$ Jegaan a
what think.2SG.EXT C 3SG Yande 3.SBJ say-EXT C 3SG Jegaan 3.SBJ
ga'-u ___$_1$]] ?
see-EXT
'What do you think Yande said Jegaan saw?'

b. Aniin$_1$ foog-o [$_{CP}$ yee **den**$_1$ ___$_1$ ndet-u Dakar] ?
who.PL think.2SG.EXT C 3PL.RES go.PL-EXT Dakar
'Who (pl.) do you think went to Dakar?'

- We can view resumption as realization of lower copies in Spec-CP (van Urk to appear).

3.1.3 Stranding

- Another diagnostic is the ability to strand material in an intermediate position.
- English allows quantifier float (see Sportiche 1988:439; Bošković 2004:713f.)

(12) a. [$_{DP}$ all the students] have [$_{vP}$ ___ [$_{VP}$ finished the test]]
b. The students have [$_{vP}$ [$_{DP}$ all ___] [$_{VP}$ finished the test]]

- Other varieties of English, such as West Ulster English, *all* can be stranded in an intermediate Spec-CP position:

(13) *Quantifier float in West Ulster English* (McCloskey 2000:58):

a. [$_{DP}$ What all]$_1$ did you get ___$_1$ for Christmas?
b. What$_1$ did you get [$_{DP}$ ___$_1$ all] for Christmas?

- Interestingly, McCloskey (2001) shows that it is possible to strand a quantifier in what looks like an intermediate Spec-CP position:

(14) *Quantifier float under long movement* (McCloskey 2000:58):
  a. [$_{DP}$ What all]$_1$ did he say [$_{CP}$ (that) he wanted ___$_1$] ?
  b. What$_1$ did he say [$_{CP}$ that he wanted [$_{DP}$ ___$_1$ all]] ?
  c. What$_1$ did he say [$_{CP}$ [$_{DP}$ ___$_1$ all] that he wanted ___$_{DP}$] ?

Potential problem:

Quantifier float might not necessarily tell us something about extraction if it involves agreement (Bobaljik 2003; Fitzpatrick 2006; Ko 2014; Heck & Himmelreich 2017).

- A similar effect is found in Afrikaans, the R-pronoun *waar-voor* ('wherefore) can be split under wh-movement:

(15) *Afrikaans* voor-*stranding* (du Plessis 1977:724):
  a. Waarvoor$_1$ werk ons nou eintlik ___$_1$?
     wherefore work we now actually
     'For what do we actually work?'
  b. Waar$_1$ werk ons nou eintlik [$_{PP}$ ___$_1$ voor] ?
     where work we now actually fore
     'What do we actually work for?'

- Under long-distance movement, it is possible to strand *-voor* in an intermediate Spec-CP position:

(16) *Intermediate stranding in Afrikaans* (du Plessis 1977:724):
  a. Waarvoor$_1$ dink julle [$_{CP}$ werk ons ___] ?
     wherefore think you work we
  b. Waar$_1$ dink julle [$_{CP}$ werk ons [$_{PP}$ ___$_1$ voor]] ?
     wherefore think you work we
  c. Waar$_1$ dink julle [$_{CP}$ [$_{PP}$ ___$_1$ voor] werk ons ___] ?
     wherefore think you for work we
     'What do you think we work for?'

- It has also been argued that Polish allows remnants of Left-Branch Extraction to appear in Spec-CP.

(17) *Left-Branch Extraction in Polish* (Wiland 2010:335):
  a. [$_{NP}$ Jaki samochód] Paweł kupił swojej żonie ___$_{NP}$?
     what car Pavel bought his wife
  b. Jaki$_1$ Paweł kupił swojej żonie [$_{NP}$ ___$_1$ samochód] ?
     what Pavel bought his wife car
     'What car did Pavel buy for his wife?'
  c. ?Jaki$_1$ *pro* myślisz [$_{CP}$ [$_{NP}$ ___$_1$ samochód] Paweł kupił swojej żonie ___$_{NP}$]?
     what think car Pavel bought his wife.DAT
     'What car did Maria think Pavel bought his wife?'

- Some speakers of English allow for intermediate stranding of an NP in English:

(18) *Possessor extraction in English* (Davis 2018*a*):
  a. Whose book$_1$ do they think [$_{CP}$ Mary read ___$_1$] ?
  b. Who$_1$ do they think [$_{CP}$ [$_{DP}$ ___$_1$'s book] Mary read ___$_{DP}$] ?
  c. %Mary is the author [$_{CP}$ who$_1$ they said [$_{DP}$ ___'s new book] is good]

- A similar paradigm has been noted for adverbs such as *exactly/precisely*:

(19) exactly-*stranding in English* (McCloskey 2000:63,fn.8)
  a. [$_{DP}$ What exactly] do you want ___$_{DP}$?
  b. What$_1$ do you want [$_{DP}$ ___$_1$ exactly] ?
  c. What$_1$ did he say [$_{CP}$ [$_{DP}$ ___$_1$ exactly] that he wanted ___$_{DP}$] ?

Problem:

Why can't all strandable items be stranded at intermediate positions?

(20) *No intermediate P-stranding in English* (Postal 1972:213):
  *Who$_1$ do you believe [$_{CP}$ [$_{PP}$ to t$_1$] Mary thinks [$_{CP}$ Joan talked t$_1$]] ?

Davis (2018*b*) suggests that this is an issue of cyclic linearization:

(21) [$_{CP}$ Who do [$_{TP}$ you think [$_{CP}$ [$_{PP}$ to ⟨who⟩] [$_{TP}$ Mary thinks [$_{CP}$ …]]]]]
  who ≺ do ≺ you … ≺ **to** … **to** ≺ **who** ≺ Mary ≺ thinks …

But this explanation won't help with unstrandable R-pronouns:

(22) *R-pronouns in German*:
  a. [$_{PP}$ Wovon] hat er keine Ahnung ___$_{PP}$?
     where.from has he no idea
  b. Wo hat er keine Ahnung [$_{PP}$ ___ von] ?
     where.from has he no idea
     'What doesn't he have a clue about?'
  c. Wo meinst du [$_{CP}$ ___ hat er keine Ahnung [$_{PP}$ ___ von]] ?
     where think you has he no idea from
  d.*Wo meinst du [$_{CP}$ [$_{PP}$ ___ von] hat er keine Ahnung ___] ?
     where think you from has he no idea

How do we rule this out? (More on this tomorrow).

3.2 Intermediate interpretation

3.2.1 Pit-stop reflexives

- Principle A of Binding Theory (Chomsky 1981) states that a reflexive like *himself* must be bound by a local c-commanding antecedent.

(23) *Reflexives need local, c-commanding antecedent*:
  a. John_i wants to shave himself_i
  b. John_i wants Peter_j to shave $\text{himself}_{*i/j}$
  c. John_i found [$_{DP}$ embarrassing pictures of himself_i]
  d. [$_{DP}$ Those pictures of himself_{*i}] embarrassed John_i

- Principle A can be satisfied under reconstruction (24a,b).
- However, reconstruction to the base position should not allow for binding by the matrix subject *John* (24c).

(24) *Intermediate reconstruction for Principle A* (Barss 1986:25)
  a. Which pictures of himself_i does John like ___ ?
  b. Which pictures of himself_i do you think [$_{CP}$ (that) John_i likes ___] ?
  c. Which pictures of $\text{himself}_{i,j}$ does John_i think [$_{CP}$ (that) Fred_j likes ___] ?

(25) a. Which pictures of himself_i does John_i like *which pictures of himself*$_i$]?
  b. Which pictures of himself_i do you think [$_{CP}$ John_i likes *which pictures of himself*$_i$]?
  c. Which pictures of $\text{himself}_{i,j}$ does John_i think [$_{CP}$ Fred_j likes *which pictures of himself*$_i$]?

- If we reconstruct the moved wh-phrase to its base-position, it is locally c-commanded by the embedded subject.
- Given the conditions on reflexive binding , *John* should not be able to be co-referent with *himself* (25c).
- However, if we have an intermediate landing site in Spec-CP (that is a possible reconstruction site) (26a), then we can explain the possibility for *John* to bind *himself* (26b)

(26) a. Which pictures of $\text{himself}_{i,j}$ does John_i think [$_{CP}$ ___ (that) [$_{TP}$ Fred_j likes ___]] ?
  b. Which pictures of $\text{himself}_{i,j}$ does John_i think [$_{CP}$ *which pictures of himself*$_{i,j}$ (that) [$_{TP}$ Fred_j likes *which pictures of himself*$_{i,j}$]] ?

Problem:

Are reflexives in *picture*-NPs logophoric (Reinhart & Reuland 1993)?

(27) a. [$_{DP}$ The picture of himself_i in the museum] bothered John_i
  b. John's misleading testimony was sufficient to ensure [$_{CP}$ that there would be pictures of himself_i all over the morning papers]

(Pollard & Sag 1992:264)

If this is true, then maybe they do not require local, c-command after all (Baltin 2003:240).

3.2.2 Reconstruction for variable binding

- Fox (1999) suggests that we can find evidence from variable binding reconstruction to an intermediate position.
- A pronoun bound by a quantifier must be c-commanded by it (albeit not locally):

(28) a. Every students_i thinks [$_{CP}$ that he_i is smart]
  b. *He_i thinks [$_{CP}$ that every student_i is smart]

- In long-distance extraction, the matrix subject could bind the wh-phrase in embedded Spec-CP or in its base position:

(29) [$_{DP}$ Which of the papers that he_i wrote] did every student_i hope [$_{CP}$ (___✓ ?) that Ms. Brown would read ___✓] ?

- We can rule out reconstruction to the base-position with Principle C, which rules out an R-expression c-commanded by a co-referent pronoun (30).

(30) *She_i thinks that [$_{CP}$ Ms. Brown_i is smart]

- If the wh-phrase contains an R-expression, then reconstructing to the base position will violate Principle C:

(31) *[$_{DP}$ Which (of the) papers that Ms. Brown_i wrote] did she_i publish ___* in LI ?
  *[$_{DP}$ Which (of the) papers that Ms. Brown_i wrote] did
  she_i publish [$_{DP}$ *which (of the) papers that Ms. Brown*$_i$ *wrote*] in LI ?
  (✗ Principle C)

- With this in place, we can rule out reconstruction to the base-position in (32).

(32) *Intermediate reconstruction for variable binding* (Fox 1999:173):
  [$_{DP}$ Which papers that he_i gave to Ms. Brown_j] did every student_i hope [$_{CP}$ ___✓ that she_j will read ___*] ?

- Reconstructing to the base position will satisfy variable binding, but violate Principle C.
- However, if we could reconstruct to an intermediate landing site, then we can satisfy the conditions on variable binding and Principle C:

(33) [$_{DP}$ Which papers that he$_i$ gave to Ms. Brown$_j$] did …
✓variable binding
every student$_i$ hope [$_{CP}$ [$_{DP}$ *which papers that he$_i$ gave to Ms. Brown$_j$*] that …
✗ Principle C
she$_j$ will read [$_{DP}$ *which papers that he$_i$ gave to Ms. Brown$_j$*]] ?

- Furthermore, we can modify the example in (32) in slightly so that *she* is in the matrix, we predict that all positions should be come unavailable:

(34) *[$_{DP}$ Which (of the) papers that he$_i$ gave to Ms. Brown$_j$] did she$_i$ hope [$_{CP}$ __* that every student$_i$ would revise __*] ?

(Fox 1999:173)

3.3 Intermediate licensing

3.3.1 Subject-auxiliary inversion

- Subject-auxiliary inversion seems to be triggered by long-distance extraction.
- A well-known case comes from Belfast English, which has optional inversion only under wh-movement:

(35) *Inversion in Belfast English* (Henry 1995:108f.):

a. What$_1$ did Mary claim [$_{CP}$ [$_{C^0}$ did] [$_{TP}$ they __ steal __$_1$]] ?

b.*Who$_1$ did John hope [$_{CP}$ [$_{C^0}$ that could] [$_{TP}$ he __ help __$_1$]] ?

c. Who$_1$ did John say [$_{CP}$ [$_{C^0}$ did] [$_{TP}$ Mary __ claim [$_{CP}$ [$_{C^0}$ had] [$_{TP}$ John __ feared [$_{CP}$ [$_{C^0}$ would] [$_{TP}$ Bill __ attack __$_1$]]]]]] ?

- Inversion is also found in Romance languages, e.g. French (Kayne & Pollock 1978) and Spanish (36).

(36) *Inverison in Spanish* (Torrego 1984:108f.):

a. Juan pensaba [$_{CP}$ que Pedro le había dicho [$_{CP}$ que la revista había publicado
Juan thought that Pedro him had told that the journal had published
ya el artículo]]
already the article
'Juan thought that Peter had told him that the journal had published the article already.'

b. Qué$_1$ *pensaba* Juan __ [$_{CP}$ que le *había dicho* Pedro __ [$_{CP}$ que *había publicado*
what thought Juan that him have told Pedro that had published
la revista __ [$_{VP}$ __$_1$]]] ?
the journal
'What did John think that Peter had told him that the journal had published?'

- The trigger for inversion has been claimed to be intermediate Ā-movement to Spec-CP.
- One possible way of analyzing this is given in Georgi (2014), who argues that a C head agrees with the moving wh-phrase.
- Consider the derivation of the embedded clause in (35b)

(37) a. [$_{CP}$ C$_{[F:\square]}$ [$_{TP}$ they could help who]]
b. [$_{CP}$ who [$_{C'}$ C$_{[F:\square]}$ [$_{TP}$ they could help __]] (*Intermediate movement*)
c. [$_{CP}$ who [$_{C'}$ C$_{[F:+]}$ [$_{TP}$ they could help __]] (*Spec-Head Agree*)
d. [$_{CP}$ who [$_{C'}$ C$_{[F:+,\ \bullet X\bullet]}$ [$_{TP}$ they could help __]] (*Insertion of HM probe*)
e. [$_{CP}$ who [$_{C'}$ [$_{C}$ C$_{[F:+]}$ could] [$_{TP}$ they __ help __]] (*Head movement*)

Question:

- What kind of insertion rule is this? Syntactic?
- It couldn't be postsyntactic (i.e. Vocabulary Insertion) if it then fed syntax (but see Martinović to appear). This might work if we want to say Head Movement is a PF operation, though (Chomsky 1995; Schoorlemmer & Temmerman 2012; Platzack 2013).

Problem:

- den Dikken (2009) claims that inversion is dubious as a diagnostic for successive-cyclic movement.
- For example, Henry (1995) points out that inversion is not possible in relative clauses:

(38) *No inversion in relative clauses in Belfast English* (Henry 1995:120):
a. This is [$_{DP}$ the man [$_{CP}$ who$_1$ John claimed [$_{CP}$ (that) I saw __$_1$]]]
b.*This is [$_{DP}$ the man [$_{CP}$ who$_1$ John claimed [$_{CP}$ did I see __$_1$]]]

- If this is triggered by successive-cyclic Ā-movement, why doesn't relativization license inversion (see Abels 2012:53ff.; Georgi 2014:234ff. for discussion)?

3.3.2 Gaps

- In V2-languages, there is often an obligatory gap in under extraction:

(39) *Embedded V2 in German* (Müller 1995:334):

a. Ich glaube [$_{CP}$ [$_{C^0}$ dass] [$_{TP}$ viele Fußball mögen]]
I believe that many football like

b. Ich glaube [$_{CP}$ viele$_1$ [$_{C^0}$ mögen$_2$] [$_{TP}$ ——$_1$ Fußball ——$_T$]]
I believe many like football

c. Ich glaube [$_{CP}$ Fußball$_3$ [$_{C^0}$ mögen$_2$] [$_{TP}$ viele$_1$ ——$_2$ ——$_T$]]
I believe football like many
'I think many people like football'

(40) *Extraction from a V2-clause must leave a gap in Spec-CP* (Thiersch 1978):

a. Wen$_1$ hat er gesagt [$_{CP}$ ——$_1$ [$_{C^0}$ dass] [$_{TP}$ die Maria [$_{vP}$ ——$_1$ getroffen] hat]] ?
who has he said that the Mary met

b. Wen$_1$ hat er gesagt [$_{CP}$ ——$_1$ [$_{C^0}$ hat] [$_{TP}$ die Maria [$_{vP}$ ——$_1$ getroffen] ——$_T$]]] ?
who has he said has the Mary met

c.*Wen$_1$ hat er gesagt [$_{CP}$ die Maria$_2$ [$_{C^0}$ hat] [$_{TP}$ ——$_2$ [$_{vP}$ ——$_1$ getroffen] ——$_T$]]] ?
who has he said the Mary has met
'Who did he say (that) Maria met?'

- If movement from an embedded clause has to pass through Spec-CP due to the PIC, then it could be blocked.
- The same effect has been reported for Dinka, which is also a V2-language:

(41) *Extraction from a V2-clause in Dinka* (van Urk 2015:133):

a. Yè ŋɔ́$_1$ yúuukúu luêeel [$_{CP}$ ——$_1$ cíi [$_{TP}$ Bôl ——$_1$ câam]] ?
be who HAB.1PL say.NF has Bol.GEN eat.NF
'Who do we say (that) Bol has eaten?'

b.*Yè ŋɔ́$_1$ yúuukúu luêeel [$_{CP}$ Bôl$_2$ àcé [$_{TP}$ ——$_2$ ——$_1$ câam]] ?
be who HAB.1PL say.NF Bol.GEN has eat.NF
'Who do we say (that) Bol has eaten?'

3.3.3 Pied-piping

- Some languages allow for pied-piping of a constituent under wh-movement:

(42) a. [$_{DP}$ Who] do you live [$_{PP}$ with ——$_{DP}$] ?
b. [$_{PP}$ With who(m)] do you live ——$_{PP}$?

- Some languages such as Basque and Quechua allow for an intermediately-moved wh-phrase to 'pied-pipe' the entire clause to matrix Spec-CP.

(43) *Clausal pied-piping in Basque* (Ortiz de Urbina 1989; Arregi 2003:118):

a. Se$_1$ pentzate su [$_{CP}$ —— idatzi rabela Jon-ek ——]] ?
what you.think written has Jon-ERG
'What do you think (that) Jon wrote?'

b. [$_{CP}$ se$_1$ idatzi rabela Jon-ek ——] pentzate su ——$_{CP}$?
what written has Jon-ERG you.think
'What do you think (that) Jon wrote?'

c. [$_{CP}$ se$_1$ idatzi rabela Jonek ——] pentzate su [$_{CP}$ esan dabela Mirenek ——$_{CP}$] ?
what written has Jon you.think said has Miren
'What do you think Miren said (that) Jon wrote?'

(44) *Clausal pied-piping in Imbabura Quechua* (Cole 1982:21):

a. ima-ta-taj$_1$ ya-ngui [$_{CP}$ —— Juan —— randi-shka-ta] ?
what-ACC-Q think-2 Juan buy-NML-ACC
'What do you think that Juan bought?'

b. [$_{CP}$ ima-ta$_1$ Juan —— randi-shka-ta]-taj ya-ngui ——$_{CP}$?
what-ACC Juan buy-NML-ACC -Q think-2
'What do you think that Juan bought?'

- We could adopt a simple percolation approach to pied-piping (e.g. Cowper 1987, however see Heck 2008, 2009; Cable 2010).

(45) *Percolation in Pied-Piping*:

a. [$_{PP}$ P DP$_{[+wh]}$]
b. [$_{PP[+wh]}$ P DP$_{[+wh]}$]

- When the wh-phrase moves to intermediate Spec-CP, percolation can apply or not:
- If it does, then the CP is now the closest goal for movement (46c).

(46) a. [$_{CP}$ DP$_{[+wh]}$ [$_{TP}$ … [$_{vP}$ … ——]]]
b. [$_{CP[+wh]}$ DP$_{[+wh]}$ [$_{TP}$ … [$_{vP}$ … ——]]]
c. [$_{CP}$ C$_{[EPP]}$ [$_{TP}$ … [$_{vP}$ … [$_{CP[+wh]}$ DP$_{[+wh]}$ [$_{TP}$ … [$_{vP}$ … ——]]] …]]]

3.3.4 Morphological reflexes of movement

- Some of the most direct evidence for successive-cyclic movement via Spec-CP comes from morphological alternations that seems to be sensitive to movement.

(47) *Complementizer alternation in Irish* (McCloskey 1979:54,150f.):

a. Dúirt mé [$_{CP}$ **gu**-r shíl mé [$_{CP}$ **go** mbeadh sé ann]
said I *go*-PAST thought I *go* would.be he there
'I said that I thought that he would be there.'

b. [$_{DP}$ an fear [$_{CP}$ Op **a** shíl mé [$_{CP}$ ___ **a** bheadh ___ ann]]]
the man a^{L} thought I a^{L} would.be there
'the man that I thought would be there'

c. [$_{CP}$ cen t-ursceal **a** mheas me [$_{CP}$ ___ **a** duirt se [$_{CP}$ **a** thuig se ___]]]?
which novel a^{L} thought I a^{L} said he a^{L} understood he
'Which novel did I think he said he understood?'

- A possible analysis is to have allomorphy rules that make reference to the featural difference between heads that do and do not trigger intermediate movement.
- Those that have an [EPP] feature to trigger intermediate movement (following Chomsky 2000) will be realized by the more specific exponent in (48a), the elsewhere form is then *go*.

(48) *Vocabulary Items for Irish* (cf. McCloskey 2002:203):

a. [C, EPP] ↔ a^{L}
b. [C] ↔ *go*

(49) [$_{CP}$ wh C$_{[\text{EPP}]}$ I thought [$_{CP}$ ___ C$_{[\text{EPP}]}$ he said [$_{CP}$ ___ C$_{[\text{EPP}]}$ [$_{TP}$ … ___]]]] ?

Complication: Opaque patterns

- Georgi (2014, 2017) points out that morphological reflexes of movement are not consistently triggered on all intermediate heads:

(50) a. [$_{CP}$ XP [$_{C'}$ **C-R** … [$_{CP}$ **C-R** … [$_{CP}$ **C-R** … ___$_{XP}$]]]]
b. [$_{CP}$ XP [$_{C'}$ **C-R** … [$_{CP}$ C … [$_{CP}$ C … ___$_{XP}$]]]]
c. [$_{CP}$ XP [$_{C'}$ C … [$_{CP}$ **C-R** … [$_{CP}$ **C-R** … ___$_{XP}$]]]]

- Duala shows the asymmetric pattern in (50c). Ā-movement triggers a particle *no* (51b,c).

(51) no-*marking in Duala* (Epée 1976:194; Biloa 1993:69):

a. Kuo a bodi nu moto kalati kiele
Kuo 3SG give that man book yesterday
'Kuo gave a book to that man yesterday.'

b. Nja$_{1}$ na bodi **no** ___$_{1}$ kalat-am kiele ?
Who 1SG give NO book-my yesterday
'Who did I give my book yesterday?'

c. Kalati$_{1}$ nde Kuo a bodi **no** nu moto ___$_{1}$ kiele
book FOC Kuo 3SG give NO that man yesterday
'It's a book that Kuo gave to that man yesterday.'

- However, under long-distance movement we only see the reflex in the matrix clause (not in the embedded clause).

(52) *Long-distance extraction in Duala* (Epée 1976:196; Biloa 1993:69):

a. Ni kalati$_{1}$ nde na ta **no** na kwalane Kuo [$_{CP}$ na a-angamene (***no**) wana ___$_{1}$]
that book FOC 1SG PST NO 1SG tell Kuo that 3SG-must *NO bring
'That's the book that I told Kuo that he should bring.'

b. Nijka buna$_{1}$ o ta **no** o kwalane mba [$_{CP}$ na o mende (***no**) timba ___$_{1}$] ?
which day you PST NO 2SG tell 1SG that 2SG FUT *NO return
'When did you tell that you would return?'

- This raises somewhat of a recurring theme – if we have successive-cyclic movement everywhere (as Phase Theory prescribes), why do we not always find evidence for it?
- Indeed, this seems to be what a theory of movement reflexes would predict that treated them as simple allomorphy with a copy/trace of a moved item (e.g. Preminger 2014:228).
- Georgi's (2014) answer is that there can be extrinsic (i.e. language-specific) ordering between final and intermediate movement steps relative to Spec-Head Agree with C.
- If Agree on C applies *before* intermediate movement, then it will not be successful.

What kind of theory of movement?

- The existence of movement reflexes might seem to support a feature-based approach to successive-cyclic movement (i.e. based on an edge feature).
- How else could the opaque patterns be derived, beyond saying successive-cyclic movement can skip some phase edges? (see Bošković 2008 for a suggestion).

4 Complementizer agreement as an argument for Feature Inheritance?

- Recall from last class that there is a view that phase heads are the locus of uninterpretable features in the phase. This implies that these features must be passed onto a non-phase head, i.e. T:

(53) *Feature Inheritance* (Chomsky 2007, 2008):
[$_{CP}$ C [$_{TP}$ T$_{[u\text{F}]}$ [$_{vP}$ DP [$_{v'}$ *v* [$_{VP}$ V$_{[u\text{F}]}$ DP]]]]]

- Some have suggested that this view is supported by examples from Dutch dialects in which both the complementizer and T agree with the same goal:

(54) Kpeinzen [$_{CP}$ de-**s** doow goa-**n** kommen]
I.think that-PL they go-PL come
'I think that they are going to come.' (*Lapscheuere Dutch*; Haegeman 1992:61)

- However, this is undermined by the fact that C and T can agree with different goals in a coordinate structure in some dialects:

(55) … de-**s** [$_{\&P}$ doow en ich] ôs treff-**e**
that-2SG you.2SG and I each.other.1PL meet-PL
'… that you and I will meet.'
(*Tegelen Dutch*; van Koppen 2005:40)

- Furthermore, there are cases in Bantu, in which the embedded complementizer agrees with *matrix* subject, whereas T agrees with the embedded subject:

(56) Alfredi a-subisi-bwe [$_{CP}$ **a**-li [$_{TP}$ ba-keni khe-**be**-eecha]]
1.Alfred 1S-cause.believe-PASS 1-that 2-guests PROG-2S-come
'Alfred was made to believe that the guests are coming.'
(*Lubukusu*; Diercks 2013:368)

5 Evidence from PF

5.1 Ellipsis

- There is an intuitively appealing idea that ellipsis targets Spell-Out domains.
- If C is a phase head, this would mean that TP would be the relevant Spell-Out domain.
- Bošković (2002) suggests that this could be correct, pointing to sluicing and Right-Node Raising as instances of TP ellipsis:

(57) a. John met someone, but I don't know who [$_{TP}$ ~~John met who~~]
b. Mary wonders when [$_{TP}$ ~~Peter left~~] and John wonders why [$_{TP}$ Peter left]

- However, this is problematic due to the following generalization of Merchant's (2001).

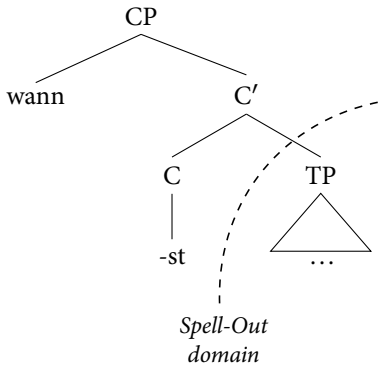
(58) *Sluicing-COMP Generalization* (Merchant 2001:62):
In sluicing, no non-operator material may appear in COMP [=C, Spec-CP].

- No material that appears in C can survive sluicing, e.g. complementizer agreement in Bavarian:

(59) *No complementier agreement under sluicing in Bavarian* (Merchant 2001:67):
a. Du woidd-st doch kumma, owa mia wissn ned wann-**st** (du) kumma woidd-st
you want-2SG PRT come but we know not when-2SG you come want-2SG
'You wanted to come but we don't know when you wanted to come.'
b. Du woidd-st doch kumma, owa mia wissn ned wann(*-st) [$_{TP}$ △]
you want-2SG PRT come but we know not when(*-2SG)
'You wanted to come but we don't know when you wanted to come.'

- This is surprising if ellipsis targets Spell-Out domains:

(60)



- Instead, it looks like it is C′ that is actually that is deleted (see Thoms 2010; Aelbrecht 2016).

5.2 *That*-trace effect

- It has been argued that the *that*-trace effect provides evidence for CP phases:

(61) a. Who do you think [$_{CP}$ Ø [$_{TP}$ ——$_1$ is smart]] ?
b.*Who do you think [$_{CP}$ that [$_{TP}$ ——$_1$ is smart]] ?
c. What$_1$ do you think [$_{CP}$ that [$_{TP}$ Bill did ——$_1$]] ?

- Sato & Dobashi (2016) claim that the *that*-trace is the result of phonological mapping between Spell-Out domains and prosodic domains (also see Kandybowicz 2006).
- They follow Dobashi (2003), who proposes the following syntax-phonology mapping:

(62) … [$_{CP}$ C $\overbrace{[_{TP}\ \text{Subj T}]}^{\text{Spell-Out domain}}$ [$_{vP}$ *v* $\overbrace{[_{VP}\ \text{V Obj}\ ]}^{\text{Spell-Out domain}}$]] ⇒ (C Subj)$_\Phi$ (T *v* V)$_\Phi$ (Obj)$_\Phi$

(63) *Condition on prosodic phrasing* (Sato & Dobashi 2016:333):
Function words cannot form a prosodic phrase on their own.

- The *that*-trace configuration therefore violates (63).

(64) a. What do you think (**that Bill**)$_\Phi$ (wrote ___)$_\Phi$
b.*Who do you think (**that** ___)$_\Phi$ (is smart)$_\Phi$
c. Who do you think (Ø ___)$_\Phi$ (is smart)$_\Phi$

Problem:

This approach requires that part of the phase edge is included in the Spell-Out domain (i.e. C and Spec-TP), also cf. Taiwanese tone sandhi yesterday.

This implies that actually the whole phase is sent to PF. The fact that PF and Spell-Out domains do not match has been noted at several points in the literature (Newell 2008; Bošković 2014, 2016; D'Alessandro & Scheer 2015; Cheng & Downing 2016).

- There is slightly different approach to to the *that*-trace effect by Erlewine (2017)

(65) *Spec-to-Spec Anti-Locality* (Erlewine 2016:431; Erlewine 2017:373):
Ā-movement of a phrase from the specifier of XP must cross a maximal projection other than XP.

- Thus, we cannot move from Spec-TP to Spec-CP (as required by Cyclic Linearization):

(66) *Who$_1$ do you think [$_{CP}$ t$_1$ [$_{C'}$ that [$_{TP}$ t$_1$ [$_{vP}$ is smart]]]] ?

- We also cannot move from Spec-TP into the matrix clause because this results in a linearization contradiction (viz. **that** and **who**)

(67) [$_{CP}$ Who do [$_{TP}$ you think] [$_{CP}$ that [$_{TP}$ ⟨who⟩ is smart]]]]
who ≺ do ≺ you … ≺ **that** … **that** ≺ **who** ≺ is ≺ smart …

- If we use the null complementizer, then the problem disappears:

(68) [$_{CP}$ Who do [$_{TP}$ you think] [$_{CP}$ Ø [$_{TP}$ ⟨who⟩ is smart]]]]
who ≺ do ≺ you think ≺ … **who** ≺ is ≺ smart …

- The wh-phrase can move directly from Spec-TP into the next higher phase because there is no linearization statement generated between *who* and the complementizer (since it is Ø)

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