Cyclicity

1 Successive-cyclic movement

- *The phenomenon*
  There is evidence that movement out of a finite CP clause cannot proceed in one fell swoop, but has to make pit stops in the intermediate [Spec, CP] positions:

  (1) **Who** did Blanche say [~~who~~ that Dorothy thought [~~who~~ that Rose saw ~~who~~]]?
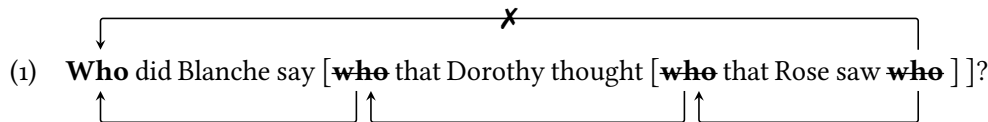
⇒ Movement across a finite clause boundary is called LONG MOVEMENT. The process by which it passes through intermediate [Spec, CP] positions is called SUCCESSIVE-CYCLIC MOVEMENT.

1.1 Complementizer switch

- A classical piece of evidence for successive cyclicity comes from Irish, where the form of a complementizer changes if an element is moved into its specifier.[1]

  [1] McCloskey (1979, 2002)

- In the absence of movement, the complementizer *go* is used:

  (2) Creidim **gu-r** inis sé bréag.
  I-believe *go*-PAST tell he lie
  'I believe that he told a lie.'

- In the presence of movement, the complementizer *aL* is used:

  (3) a. Céacu ceann **a** dhíol tú ___ ?
  which one *aL* sold you
  'Which one did you sell?'

  b. an fhilíocht **a** chum sí ___
  the poetry *aL* composed she
  'the poetry that she composed'

- Importantly, long movement affects *all* complementizers between the launching and the landing site:

  (4) Cén túrscéal **a** mheas mé **a** dúirt sé **a** thuig sé?
  which novel *aL* though I *aL* said he *aL* understood he
  'Which novel did I think he said he understood?'

⇒ This pattern follows if long movement is successive cyclic, i.e. passes through all intermediate [Spec, CP] positions.

- Other languages with such patterns include Chamorro (Chung 1982), Kîîtharaka (Abels and Muriungi 2008), and Wolof (Torrence 2005).

1.2 *Wh*-copying

- In some languages, *wh*-phrases that have undergone long movement can optionally be doubled in [Spec, CP] that this movement has crossed:

  (5) **German**[2]

    a. **Wen** glaubst du [dass Maria ___ gesehen hat]?
       who think you that Maria seen has
       'Who do you think that Mary saw?'

    b. **Wen** glaubst du [**wen** Maria ___ gesehen hat]?
       who think you who Maria seen has
       'Who do you think that Mary saw?'

  (6) *Child English*[3]

    a. **Who** do think [**who** Grover wants to hug ___]?

    b. **What** do you think [**what** Cookie Monster eats ___]?

    c. **What** do you think [**what** the baby drinks ___]?

[2] The situation is a bit more complex in German. Only *was* 'what' and *wen* 'who' can do this copying.

[3] Thornton (1995)

1.3 Word order

- In some languages, the word order of the embedded clause reveals that movement to [Spec, CP] has taken place.

- ***German embedded V2***

  – Embedded clauses can be V2 in some cases, but for these cases, V1 is impossible:[4]

    (7) a. Maria hat gesagt [der Fritz **hat** den Peter getroffen]
           Maria has said the Fritz has the Peter met
           'Maria said that Fritz met Peter.'

        b. *Maria hat gesagt [**hat** der Fritz den Peter getroffen]
           Maria has said has the Fritz the Peter met

  – But if an element is moved out of an embedded V2 clause, the embedded clause must be V1:

    (8) a. **Wen** hat Maria gesagt [**hat** der Fritz ___ getroffen]?
           who has Maria said has the Fritz met
           'Who did Maria say that Fritz met?'

        b. ***Wen** hat Maria gesagt [der Fritz **hat** ___ getroffen]?
           who has Maria said the Fritz has met

  – The account of these facts is that the embedded [Spec, CP] is occupied by a copy of the moving element, satisfying V2:

    (9) **Wen** hat Maria gesagt [~~wen~~ hat der Fritz ~~wen~~ getroffen]?
        who has Maria said who has the Fritz who met

[4] "V2" is verb-second, while "V1" is verb-initial. This is a phenomenon found in all Germanic languages to varying degrees, but which does exist in other languages as well, e.g. Dinka and Kashmiri.

- **Subject–auxiliary inversion in Belfast English**[5]

(10) a. Who did John hope [**would** *he* see ___]?

    b. What did Mary claim [**did** *they* steal ___]?

    c. Who did John say [**did** *Mary* claim [**had** *John* feared [**would** *Bill* attack ___]]]?

- **Spanish 'stylistic inversion'**[6]

(11) a. Juan pensaba [$_{CP}$ que Pedro le   había dicho [$_{CP}$ que la   revista
      Juan thought   that Pedro him had   told   that the journal

        había publicado ya   el   artículo]]
        had   published already the article

      'Juan thought that Pedro had told him that the journal had published the article already'

    b. Qué pensaba Juan [$_{CP}$ que le   **había dicho** *Pedro* [$_{CP}$ que **había**
      what thought Juan   that him had   told   Pedro   that had

        publicado *la   revista* ___]]?
        published   the journal

      'Which did Juan think that Pedro had told him that the journal had published?'

2 Subjacency

∗ An extremely influential proposal that tied successive cyclicity and movement together was SUBJACENCY:[7]

(12) **SUBJACENCY CONDITION**

    a. In a structure $[\alpha \ldots [\beta \ldots [\gamma \ldots \delta \ldots] \ldots] \ldots]$, movement of δ to α cannot apply if β and γ are bounding nodes.

    b. DP and TP are bounding nodes.[8]

- In Chomsky's work, there are various proposals about how to define bounding nodes, but we will just assume that they are DP and TP.[9]

⇒ **Successive-cyclic movement**
Subjacency forces intermediate landing sites in [Spec, CP], as otherwise long movement would cross two TPs:

(13) **Who** did $\boxed{[_{TP}}$ Dorothy think [~~who~~ that $\boxed{[_{TP}}$ Rose saw ~~who~~]]]?

⇒ **Islands**
Subjacency is captures some island constraints in terms of too many bounding nodes being crossed in one movement step:

(14) **Complex NP Constraint**
   ∗**Which book** did $\boxed{[_{TP}}$ John hear $\boxed{[_{DP}}$ a rumor [$_{CP}$ ~~which book~~ that [$_{TP}$ you had read ~~which book~~]]]]?

(15)   ***Wh*-Islands**
       How did $\boxed{_{\text{TP}}}$ she wonder [$_{\text{CP}}$ *which car* $\boxed{_{\text{TP}}}$ Mary fixed ~~which car~~ **how]]?

- Note that the subjacency account of these islands requires that only [Spec, CP] can be used as an intermediate landing site.

3   Cycles

- Recall *wh*-islands and the descriptive constraint that characterizes them:

  (16)   ***Wh*-Island Condition**
         Movement must not cross a CP with a *wh*-element in [Spec, CP] or C.

         [Chomsky 1964, 1973]

  (17)   *[Which book] do you wonder [$_{\text{CP}}$ who [~~who~~ read ~~which book~~]]?

- *A problem*
  - According to the *Wh*-Island Condition and to Subjacency (which is intended to *derive* this constraint) nothing rules out a derivation like the following:

    (18)   *Which book do you wonder [who ~~who~~ read ~~which book~~]?

    ① ②
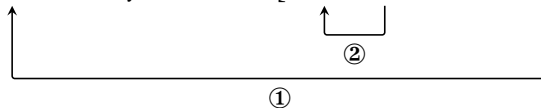
  - In this derivation, *which book* moves before *who* (possibly through embedded [Spec, CP]). At this point in the derivation, there is no *wh*-island blocking the movement.

  - After *which book* moves, *who* is retroactively moved in the embedded clause.

∗ *The cycle*
  Such derivations are excluded by the STRICT CYCLE CONDITION:[10]

  (19)   **Strict Cycle Condition (SCC)**
         No operation can apply to a domain dominated by a cyclic node α in such a way as to affect solely a proper subdomain of α dominated by a node β which is also a cyclic node.   [Chomsky 1973]

  (20)   **Cyclic node**
         Every XP is a cyclic node.

⇒ *Consequences: No countercyclicity*
  - In (18), when *which book* moves, the next lower cyclic node is the matrix TP. Consequently, no element can move solely within this TP, thereby excluding this problematic derivation.

  - All movement is upwards, extending the tree; no downwards movement.

  - No 'sidewards' movement into another constituent.[11]

[10] This is related to the Extension Condition, which says that MERGE may only target a root node.

[11] cf. Nunes (2001, 2004)

(21)

XP
YP   X̄
X   ⋮
⋮   Y̶P̶

(22) *

XP
WP   X̄
YP W   X   ⋮
⋮   Y̶P̶
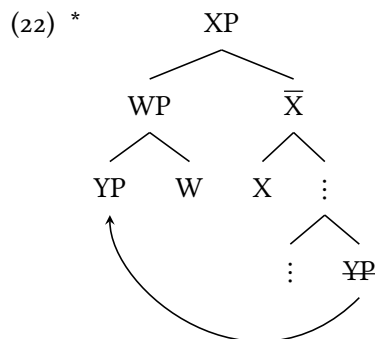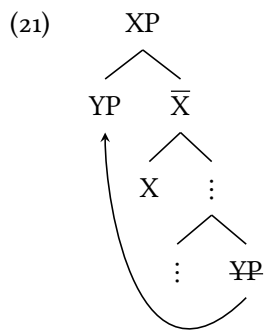
✽ **The Extension Condition**

A stricter version of the cycle is the EXTENSION CONDITION:[12]

(23) **EXTENSION CONDITION**
MERGE can only target a root node.   [Chomsky 1993, 1995]

• **On head movement**

  – There is a sense in which head movement is always *countercyclic.*

  – Head movement violates the Extension Condition, which led Chomsky to argue that head movement is not real movement.

  – According to the SCC though, only *phrases* count as cyclic nodes. On such a definition, head movement does not violate the cycle.

4 Phases

✽ Developing an idea by Uriagereka (1999), Chomsky (2000, 2001) proposes that syntactic structure is periodically 'spelled out' to the interfaces (PF and LF), rendering it 'invisible' to the rest of the derivation. Such domains are called PHASES.[13]

(24) **PHASES**
CP and vP are phases.[14]

(25) **PHASE DOMAINS AND EDGES**

  a. The DOMAIN of a phase XP is its complement.

  b. The EDGE of a phase comprises XP's specifier(s), adjuncts to XP, and its head X.

(26) **PHASE IMPENETRABILITY CONDITION** *(strong version)*
In a phase α with head H, the domain of H is not accessible to operations outside of α, only H and its edge are accessible to such operations.
                                                    [Chomsky 2000]

(27) **PHASE IMPENETRABILITY CONDITION** *(weak version)*
In a phase α with head H, the domain of H is not accessible to operations at the next highest phase, only H and its edge are accessible to such operations.
                                                    [Chomsky 2001]

[12] An even stricter version is that both arguments of MERGE must be root nodes, thus doing away with Internal Merge and driving us towards a certain flavor of multidominance (Johnson 2012).

[13] On Chomsky's original proposal, only transitive v is a phase.

[14] The status of vP as a phase is debated; see Keine and Zeijlstra (2021) for critical discussion.

- **Phases and successive cyclicity**
  Phases enforce successive-cyclic movement through their edge (specifier). The only way for an element inside the domain of a phase to escape spellout is for this element to move to the specifier of the phase.

  – If CP and vP are phases, then successive-cyclic movement is quite pervasive. It has to target both [Spec, CP] and [Spec, vP]:

  (28) $[_{CP}$ **XP** C^0 $[_{TP}$ T^0 $\boxed{[_{vP}}$ **XP** $v^0[_{VP}$ V^0 $\boxed{[_{CP}}$ **XP** C^0 $[\ldots$ **XP** $\ldots]]]]]]$

- **The cycle as the phase**
  Phases also derive a version of the cycle, with CP and vP being the cyclic nodes. For example, it follows that *wh*-movement out of a clause cannot derivationally precede *wh*-movement within that clause.

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