

Ling 165B: Syntax II

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The constraints

All the constraints we are going to see have the general format:

Constraint XYZ: Movement cannot extract anything from a certain type of structure that looks like this...

Wh-islands:

It is not possible to move a wh-phrase out of an embedded question.

That is:

- (i) a wh-phrase cannot move out of a CP whose head is [+wh] (and therefore the specifier is filled with another wh-phrase)
 - (ii) a wh-phrase cannot move out of a CP whose head is *whether* or *if*.
- (1) a. You know [CP why Bill called the police]
b. You know [CP why who called the police]
c. *Who_i do you know [CP why t_i called the police]?

Sentential Subject Constraint I

Sentential Subject = a subject that is a clause.

The Sentential Subject Constraint:

No element can move out of a CP that is in the subject position.

- (2) a. [_{CP} that Bill threw your things out of the room] really annoyed you
b. [_{CP} that Bill threw what out of the room] really annoyed you
c. *What_i did [_{CP} that Bill threw t_i out of the room] really annoy you?
- (3) a. [_{CP} that most people didn't vote last year] was terrible
b. [_{CP} that most people didn't vote when] was terrible
c. *When_i was [_{CP} that most people didn't vote t_i] terrible?

The Adjunct Island Condition I

The Adjunct Island Condition:

No element in a CP inside an adjunct may move out of this adjunct.

- (4) a. He went home [_{PP} before [_{CP} Mary finished the homework]]
b. He went home [_{PP} before [_{CP} Mary finished what]]
c. *What_i did he go home [_{PP} before [_{CP} Mary finished t_i]]

Complex NP Constraint (CNPC) I

Complex NP Constraint (CNPC):

No element inside a CP dominated by a NP can be moved out of this NP

Complex NP = a DP that contains a CP.

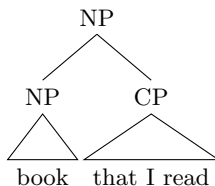
The CP could be either

- (i) complement of the noun or
- (ii) adjunct to the NP.

Complex NP Constraint (CNPC) III

Relative Clause type CNPC violations:

The relative clause is an adjunct to the NP



- (7) a. Sue watched [DP the [NP movie] [CP which Bill recommended]]
b. Sue watched [DP the [NP movie] [CP which who recommended]]
c. *Who_i did Sue watch [DP the [NP movie] [CP which t_i recommended]]?

The Subject Condition I

When it comes to extraction out of DPs we find an asymmetry between *objects* and *subjects*.

→ It is ok to extract a DP out of a DP object of a verb:

- (8) a. You saw [DP a picture of [DP some students]]
b. You saw [DP a picture of [DP which students]]
c. [DP Which students]_i did you see [DP a picture of t_i]?

→ It is ungrammatical to extract a DP out of DP that is the subject of a verb:

- (9) a. [DP a picture of [DP some students]] appeared in the newspapers
b. [DP a picture of [DP which students]] appeared in the newspapers
c.*[DP Which students]_i did [DP a picture of t_i] appear in the newspapers?

The Subject Condition:

A DP cannot be extracted from a DP subject of a clause.

The Left Branch Constraint I

The Left Branch Constraint:

The DP subject of a larger DP cannot be extracted out of this larger DP

- (10) a. You are eating [DP [DP John]_s cake]
b. You are eating [DP [DP who] se cake]
c. *Whose_i are you eating [DP t_i cake]? / *Who_i are you eating [DP t_i's cake]?

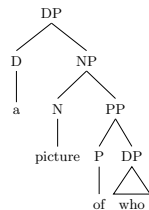
In this cases, in order to circumvent the effects of The Left Branch Constraint, we can pied-pipe the entire DP:

- (11) a. You are eating [DP [DP who] se cake]
b. Whose cake_i are you eating t_i?

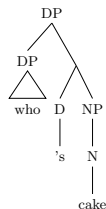
The Left Branch Constraint II

Nota Bene The difference between (40) and (41) on the one hand and (10) on the other is that:

→ In both (40) and (41) the extracted DP was itself (part of) a complement of a noun. We saw that extraction works if the entire DP *a picture of some students* is complement of a verb. It does not if it is the external argument (subject).



→ In (10) the DP we are trying to extract is in a specifier position instead. It is a subject.



Coordinate Structure Constraint:

No conjunct or element contained within a conjunct of a coordination can be moved out of this coordination.

→ This constraint bans the movement of either conjunct:

- (12) a. You ate [_{DP} [_{DP} some chicken] and [_{DP} rice]]
b. You ate [_{DP} [_{DP} what] and [_{DP} rice]]
c. *What_i did you eat [_{DP} t_i and [_{DP} rice]]?
- (13) a. You ate [_{DP} [_{DP} some chicken] and [_{DP} rice]]
b. You ate [_{DP} [_{DP} some chicken] and [_{DP} what]]
c. *What_i did you eat [_{DP} [_{DP} some chicken] and t_i]?

→ It also bans the movement of some wh-phrase from inside one of the conjuncts:

- (14) a. You [VP [VP ate some pie] and [VP drank some coffee]]
b. You [VP [VP ate what] and [VP drank some coffee]]
c. *What_i did you [VP [VP eat t_i] and [VP drank some coffee]]?
- (15) a. You [VP [VP ate some pie] and [VP drank some coffee]]
b. You [VP [VP ate some pie] and [VP drank what]]
c. *What_i did you [VP [VP eat some pie] and [VP drank t_i]]?

- (16) a. Bill thinks that $[_{TP} [_{TP}$ Tom gathered the data] and $[_{TP}$ you wrote the paper]]
b. Bill thinks that $[_{TP} [_{TP}$ Tom gathered what] and $[_{TP}$ you wrote the paper]]
c. *What_i does Bill think that $[_{TP} [_{TP}$ Tom gathered t_i] and $[_{TP}$ you wrote the paper]]?
- (17) a. Bill thinks that $[_{TP} [_{TP}$ Tom gathered the data] and $[_{TP}$ you wrote the paper]]
b. Bill thinks that $[_{TP} [_{TP}$ Tom gathered the data] and $[_{TP}$ you wrote what]]
c. *What_i does Bill think that $[_{TP} [_{TP}$ Tom gathered the data] and $[_{TP}$ you wrote t_i]]?

→ There is a systematic class of exceptions to the CSC. An element can be moved out of one of the conjuncts if a “parallel” element is also moved from the others. This is called Across-the-Board extraction or **ATB**.

- (18) a. Bill thinks that Tom wrote the paper and you criticized it
b. Bill thinks [_{CP} that [_{TP} Tom wrote the paper] and [_{TP} you criticized it]]
c. Bill thinks [_{CP} that [_{TP} Tom wrote what] and [_{TP} you criticized what]]
d. What_i does Bill think [_{CP} that [_{TP} Tom wrote t_i] and [_{TP} you criticized t_i]]?

The subadjacency Condition

The subjacency condition is a general syntactic locality constraint on movement. It was an ambitious attempt by Chomsky (1973) to subsume the island constraints under a single structural principle. It can be stated as follows:

Subjacency Condition:

MOVE cannot relate two positions across two bounding nodes.

*...XP_i... [_α...[_β...t_i..., if α and β are bounding nodes

We will need to define what counts as a bounding node.

Working hypothesis: TPs are bounding nodes.

*...XP_i... [*TP*...[*TP*...t_i...,]]

→ if we take TP as a bounding node, the subadjacency condition can easily derive wh-island condition violations.

(19)*Who_i do [_{TP} you know [_{CP} why [_{TP} t_i called the police]]]?

(20)*[_{CP} wh-XP_i [_{TP} ... [_{CP} wh-element [_{TP} ... t_i ...]]]]

→ It can also derive the sentential subject constraint.

(21)*When_i was [_{TP} [_{CP} that [_{TP} most people didn't vote t_i]] terrible]?

(22)*[_{CP} wh-XP_i [_{TP} [_{CP} [_{TP} ... t_i ...]] ...]]

→ It can also derive the adjunct island condition. In this case as well, extraction would cross two TP boundaries.

(23)*What_i did [_{TP} he go home [_{PP} before [_{CP} [_{TP} Mary finished t_i]]]]

(24)*[_{CP} wh-XP_i [_{TP} ... [_{PP} [_{CP} [_{TP} ... t_i ...]]]]]

→ And the complex noun phrase as well.

(25)*What_i did [_{TP} you hear [_{DP} the [_{NP} rumor [_{CP} that [_{TP} Bill has broken _{t_i}]]]]]]?

(26)*[_{CP} wh-XP_i [_{TP} ... [_{DP} [_{NP} [_{CP} [_{TP} ... t_i ...]]]]]]

→ Unfortunately, the Subjacency condition also excludes well-formed sentences that should not be excluded!

(27) a. Bill thinks that Sue said that I broke a vase.

b. [_{TP} Bill thinks [_{CP} that [_{TP} Sue said [_{CP} that [_{TP} I broke what]]]]]]

c. [_{CP} What_i does [_{TP} Bill think [_{CP} that [_{TP} Sue said [_{CP} that [_{TP} I broke t_i]]]]]]]]

In some cases, potentially infinite embedding does not result in deviance. *How do we solve this problem?*

- (i) we may rethink the way in which the Subjacency Condition works, or
- (ii) we may rethink the way in which movement works.

Let's go with (ii)!

Successive cyclic movement I

- When we move a phrase, we must always move it to the closest available [Spec,CP] there is.

closest available = the first c-commanding [Spec,CP] that is not already occupied by something else.

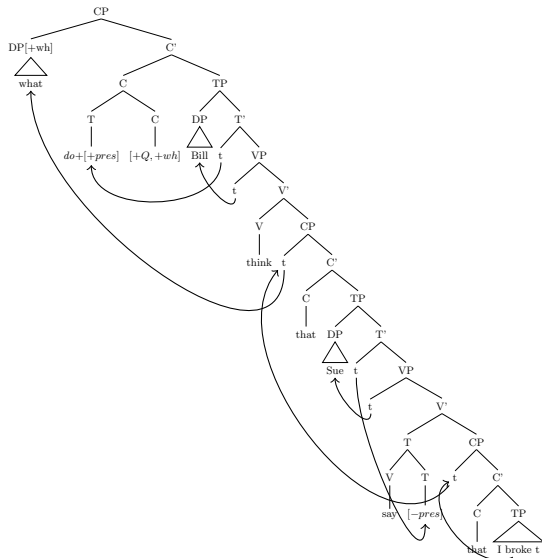
- Superficially unbounded extractions would take place in successive steps, from [Spec, CP] to [Spec, CP]. This is called successive cyclic movement.

This implies that a [+wh] phrase can temporarily move to the specifier of a C head that is not [+wh]. But recall Scottish Gaelic:

- (28) Dè a thuirt sibh a sgrìobh i
What WH-C say.PAST 2s.POLITE WH-C write.PAST she
'What did you say that she wrote?'

- (29) [_{CP} What_i does Bill think [_{CP} t_i that Sue said [_{CP} t_i that I broke t_i]]]

Successive cyclic movement II



Successive cyclic movement III

→ The wh-island constraint can now be accounted for in the following way.

(30)*Who_i do [_{TP} you know [_{CP} why [_{TP} t_i called the police]]]?

- Once *why* moves to the subordinate [Spec,CP] that position is not available. Therefore, *who* cannot move there.
- Since *who* cannot move to the subordinate [Spec,CP], movement to the matrix [Spec,CP] is also blocked by the subjacency condition (It would cross two bounding nodes).

→ It can also account for the Complex NP constraint (in the case of relative clauses) - at least under some analyses of relative clauses.

(31)*Who_i did Sue watch [_{DP} the [_{NP} movie] [_{CP} which t_i recommended]]?

(32) [_{DP} the [_{NP} [_{NP} movie]_i [_{CP} [_{DP} which t_i]_k [_{C'} C [_{TP} Bill/who recommended t_k]

Successive cyclic movement IV

→ But we are in trouble w.r.t. the other constraints. If we allow successive cyclic movement, each movement only crosses one bounding node!

Here is what we obtained allowing successive cyclicity. We can now derive well formed sentences such as (27-c) or (29) (extraction out of a simple CP complement), but we wrongly predict the possibility of extraction out of certain islands.

| | Wh-Isld | SntSub | AdjIsld | CNPC(r) | CNPC(c) | ComplCP |
|------------------|---------|--------|---------|---------|---------|---------|
| TP bounding | ✓ | ✓ | ✓ | ✓ | ✓ | * |
| + Succ Cyclic | ✓ | * | * | ✓ | * | ✓ |

[In the table, a * indicate a wrong prediction, a ✓ a right prediction]

Successive cyclic movement V

That is, sentences like (33-a) are correctly predicted to be good, but ill-formed ones (such as (34-a)) are incorrectly predicted to be grammatical. (b) shows the successive cyclic movement. As you can see it does not violate subjacency.

- (33) a. What does Bill think that Sue said that I broke?
b. $[_{CP} \text{What}_i \text{ does Bill think } [_{CP} t_i \text{ that Sue said } [_{CP} t_i \text{ that I broke } t_i]]]$
- (34) a.*When was that most people didn't vote terrible?
b. $[_{CP} \text{When}_i \text{ was } [_{CP} t_i \text{ that most people didn't vote } t_i] \text{ terrible }]?$

Practice

Show that the wrong prediction is made for the CNPC (compl) as well.

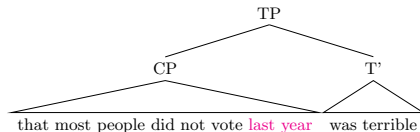
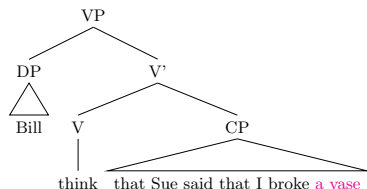
Successive cyclic movement VI

How can we distinguish between (33-a) and (34-a) (repeated in (35-a) and (35-b))?

- (35) a. What_i does Bill think that Sue said that I broke t_i?
b.*When_i was that most people didn't vote t_i terrible ?

What properties distinguish (35-a) and (35-b)?

- In (35-a) (the good case), the CP is a complement of the verb.
- In (35-b) (the bad case), the CP is a subject.



Bounding Nodes I

Let's revise our definition of what counts as a bounding node. Recall, our working hypothesis was that only TPs count as bounding nodes.

Bounding nodes:

- (i) TPs
- (ii) CPs that are not complements of V

The subadjacency condition can then be formulated as:

Subadjacency Condition:

MOVE cannot relate two positions across two bounding nodes.

*...XP_i... [_α...[_β...t_i...], if α and β are bounding nodes

Bounding node: CPs that are not complements of V and TPs

Bounding Nodes II

If CPs that are not complements of V are also bounding nodes, then the difference between (35-a) and (35-b) can be derived.

→ In (35-a), the wh-phrase never moves across two bounding nodes.

- The CP boundaries do not count as bounding nodes because they are complement of V (*say* and *think*).
- TPs count as bounding nodes.
- Since every step only crosses one bounding node (the TP node), subadjacency is not violated.
- Therefore, the sentence is correctly predicted to be grammatical.

Bounding Nodes III

→ In (35-b), we get a subjacency condition violation.

- TPs count as bounding nodes as usual.
- The first movement only crosses one bounding node (the TP boundary). Therefore this first step is legit.
- The CP boundary here does count as a bounding node because the CP is NOT complement of V (the CP is in subject/specifier position).
- Since, CP is a bounding node, the second movement crosses two bounding nodes, TP and CP.
- Therefore, the sentence is correctly predicted to be ungrammatical.

(36)*[_{CP} When_i was [_{TP} [_{CP} t_i that [_{TP} most people didn't vote t_i]] terrible]]?

Bounding Nodes IV

→ With this additional assumption (that CPs that are not complements of V are also bounding nodes) the other constraints are also derived.

| | Wh-Isld | SntSub | AdjIsld | CNPC(r) | CNPC(c) | ComplCP |
|---------------------------------|---------|--------|---------|---------|---------|---------|
| TP bounding | ✓ | ✓ | ✓ | ✓ | ✓ | * |
| + Succ Cyclic | ✓ | * | * | ✓ | * | ✓ |
| CP BN unless comp of V | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |

[In the table, a * indicate a wrong prediction, a ✓ a right prediction]

Practice

Show that now the correct prediction is made for the CNPC (compl) as well.

Oops! We seem to have a problem with raising verb constructions!

→ Extraction out of raising constructions is well-formed:

- (37) a. We seem to have some kind of problems
b. What kind of problems do we seem to have t?

→ Recall, we assumed that verbs like *seem* take TP complements in raising structures.

This means that wh-movement here would happen in a single step (there is no intermediate CP node in the derivation):

- (38) [What kind of problems]_i do [TP we seem [TP to have t_i]]

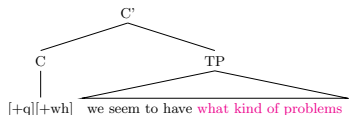
→ This should be a subjacency condition violation. The wh-phrase moves across two TP boundaries.

Bounding Nodes VI

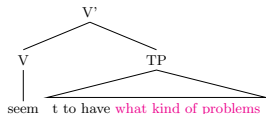
New proposal: Complements of V are not bounding nodes.

Does this solve our problem with raising constructions? YES!

→ The higher TP is complement of C. Therefore it still counts as a bounding node.



→ The lower TP is complement of the V *seem*. Therefore it does not count as a bounding node.



→ So, wh-movement crosses only one bounding node and subjacency is obeyed!

(39) [What kind of problems]_i do [**TP** we seem [_{TP} to have t_i]]

Bounding Nodes VII

Oops! We cannot account for the subject condition, though! That is, the subject condition is not subsumed by the Subjacency Condition.

The Subject Condition:

A DP cannot be extracted from a DP subject of a clause.

→ It is ok to extract a DP out of a DP object of a verb:

- (40) a. You saw [DP a picture of [DP some students]]
b. You saw [DP a picture of [DP which students]]
c. [DP Which students]_i did you see [DP a picture of t_i]?

→ It is ungrammatical to extract a DP out of DP that is the subject of a verb:

- (41) a. [DP a picture of [DP some students]] appeared in the newspapers
b. [DP a picture of [DP which students]] appeared in the newspapers
c.* [DP Which students]_i did [DP a picture of t_i] appear in the newspapers?

In particular, the right prediction is made for (40-c) but not for (41-c). Both cases are predicted to be grammatical because the wh-phrase never crosses more than one bounding node (the TP).

(42) [_{DP} Which students]_i did [_{TP} you see [_{DP} a picture of t_i]]?

(43)*[_{DP} Which students]_i did [_{TP} [_{DP} a picture of t_i] appear in the newspapers]?

Bounding Nodes IX

| | Wh- Isld | Snt Sub | Adj Isld | CNPC (rc) | CNPC (comp) | Cmpl CP | Subj Cond | DP Obj |
|---------------------------|-------------|------------|-------------|--------------|----------------|------------|--------------|-----------|
| TP bound- ing | ✓ | ✓ | ✓ | ✓ | ✓ | * | * | ✓ |
| + Succ Cyclic | ✓ | * | * | ✓ | * | ✓ | * | ✓ |
| CP BN unless V-comp | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | * | ✓ |

[In the table, a * indicate a wrong prediction, a ✓ a right prediction]

Bounding Nodes X

New proposal: DPs are also bounding nodes (unless they are complements of V).

As a result a subject DP is a bounding node, an object DP is not. Now the right predictions are made for (40-c) and (41-c)

→ Extraction from a DP object only crosses a bounding node. Therefore, subjacency is obeyed.

(44) [_{DP} Which students]_i did [_{TP} you see [_{DP} a picture of t_i]]?

→ Extraction from a DP subject crosses two bounding node. Therefore, it violates the subjacency condition.

(45)*[_{DP} Which students]_i did [_{TP} [_{DP} a picture of t_i] appear in the newspapers]?

Bounding Nodes XI

| | Wh- Isld | Snt Sub | Adj Isld | CNPC (rc) | CNPC (comp) | Cmpl CP | Subj Cond | DP Obj |
|-------------------------------------|-------------|------------|-------------|--------------|----------------|------------|--------------|-----------|
| TP bound- ing | ✓ | ✓ | ✓ | ✓ | ✓ | * | * | ✓ |
| + Succ Cyclic | ✓ | * | * | ✓ | * | ✓ | * | ✓ |
| CP BN unless V-comp | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | * | ✓ |
| CP and DP BN unless V-comp | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |

[In the table, a * indicate a wrong prediction, a ✓ a right prediction]

Wh-movement is constrained by the subjacency condition.

Subjacency Condition (final version):

MOVE cannot relate two positions across two bounding nodes.

*...XP_i... [_{α} ...[_{β} ...t_i...], if α and β are bounding nodes

Bounding node: A node is bounding if it is a TP, a CP or a DP and it is not a complement of V.

In addition, we have concluded that wh-movement can proceed stepwise through intermediate [Spec,CP] positions. We called this *successive cyclic movement*.