Scope, binding, and what's beyond the surface

3: Life without movement

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UCL, Oct 21–23, 2015

So far

- Scope reconstruction can be dissociated from binding reconstruction (Lechner 1998).
- Neither is tied to movement.
  - Scope reconstruction is found across grammatical dependencies.
    - Short scrambling
    - Some types of Obligatory Control
    - Movement
  - Binding reconstruction is found between elements which share a θ-role.
    - Specificational sentences
    - Movement
- This raises the prospect of a characterization of movement as the co-occurrence of a scope chain and a binding chain, with no distinctive properties of its own beyond presence of a particular lexical item (t).

Today

- Does movement have properties?
- Trapping effects
- Characterizing scope and binding chains

Section 1

Does movement have properties?

Scope chains and binding chains together

- Scope chains (A-scrambling, OC, movement) regulate the distribution of scope reconstruction.
- Binding chains (weak islands, specification, movement) regulate the distribution of binding reconstruction.
- Movement alone shows both scope reconstruction and binding reconstruction.
- So a minimal theory of movement would be that movement is just what happens when a scope chain and a binding chain co-occur.

In other words

- If movement = scope chain + binding chain, movement is a grammatical dependency betwen elements which "share a θ-role".
- It's worth exploring the possibility that that's all movement is.
- If this is tenable, it's a new kind of argument against movement (or copies, or slashes, or any kind of bespoke representation of that class of dependencies):
  - "Movement" is just the co-occurrence of two dissociable relations.
  - A good representation preserves that dissociability.
  - *If* movement has no other properties, we want a theory that entails that.

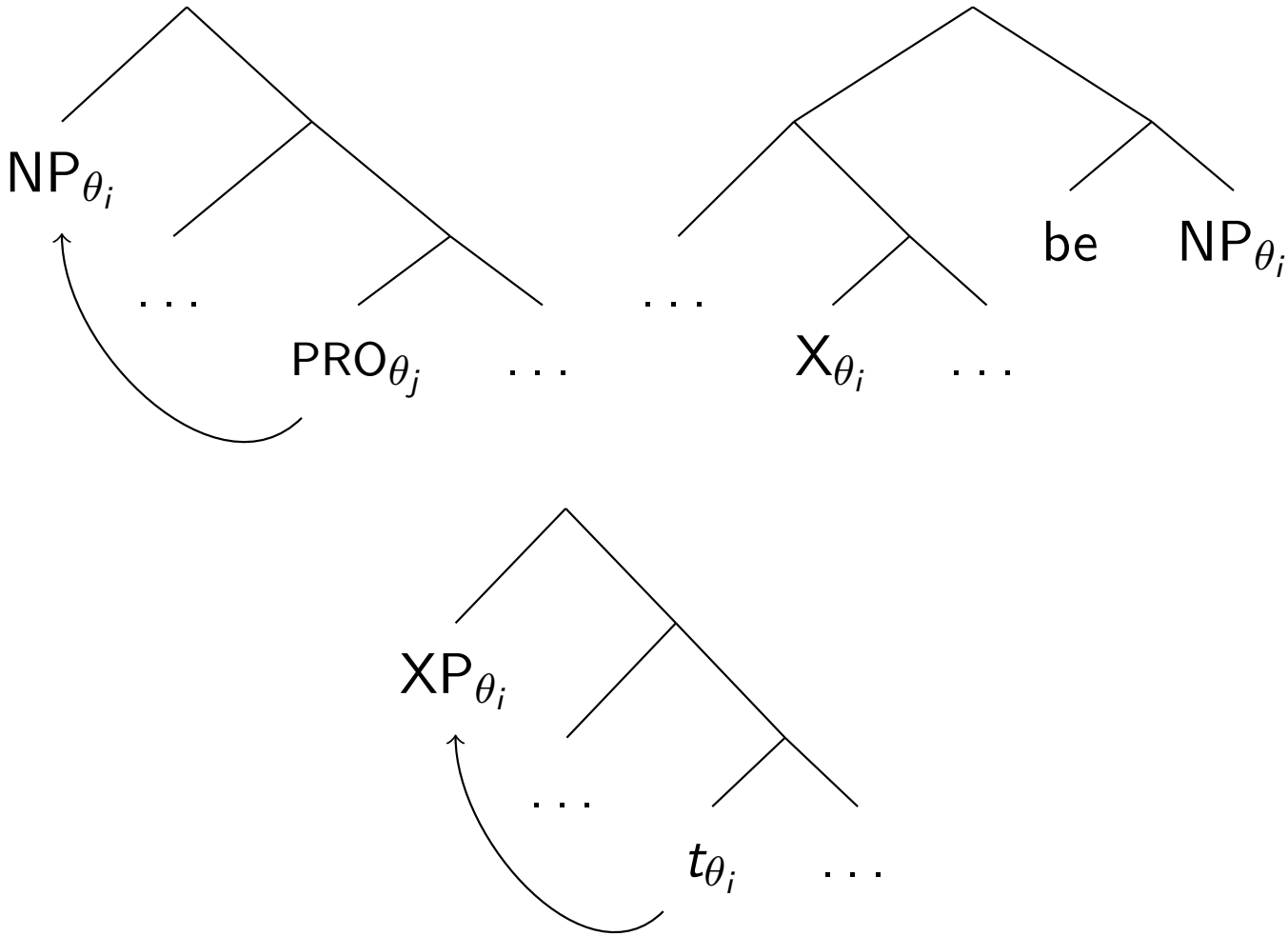
Details

- What's at the foot of the chain?
- Other properties of movement (esp. locality).
- A′-dependencies without scope reconstruction.
- Trapping effects

What's at the foot of the chain?

- I defer to Neeleman & van de Koot (2002) (at least in spirit):
  - Give yourself a lexical item (call it *trace*).
  - Make sure you can't hear it (unless you can).
  - Make it grammatically dependent on an antecedent.
  - Make it share a θ-role with an antecedent.
- The major advantage over Lechner (1998) is that the characterization of scope chains and binding chains doesn't entail that there are different objects at the foot of the two types of chains.
- That's what allows a composite treatment of movement to get off the ground.

So



Is this viable?

Does movement have properties?

- Composite definitions of movement have some pedigree (e.g. Chomsky 1977, 1981).
- What's different about the proposed composite here is that none of the composed properties are unique to movement.
- Compare Chomsky (1981):
  - Leaves a trace
  - Obeys Subjacency
  - Etc.
- I can see two major reasons why this wouldn't be viable:
  1. Movement is unique w.r.t. locality (e.g.).
  2. Movement has semantic consequences that other relations don't.

Movement and locality

- Hard to be precise about movement and locality because Minimalist locality theory has always been in flux.
- But the general trend (Chomsky 2000, 2001) is towards "movement has no properties".
- This reverses the earlier trend from Ross (1967)–Chomsky (1986) under which movement was increasingly central to syntactic locality theory.
- Now we have:
  - conditions on Agree (Minimal Link Condition, Phase Impenetrability Condition)
  - conditions on Spell-out (PIC, also Uriagereka 1999).
- There's also a long tradition of overstating the syntacticity of locality of movement (important roles for processing, semantics, etc.: Morgan 1975, Kluender 1992, Szabolcsi & Zwarts 1993, Truswell 2011).
- More challenging: strong islands. Agree into strong islands is widely taken to be possible ($\rightarrow$ strong islands don't block all syntactic dependencies).

Other possible arguments

- We'll look at two more possible arguments that movement has properties here:
  1. Only movement allows reconstruction for idiomatic interpretation.
  2. Extraction out of weak islands has a different reconstruction profile (Lechner 1998).

Subsection 1

Any unique types of reconstruction?

Idiom chunks

- One type of reconstruction seems to be unique to movement: idiomatic interpretation.

(1) a. The shit seems to have hit the fan.
b. #The shit wants to hit the fan.
c. #What the shit hit was the fan.

(2) a. Something's eating her.
b. What's eating her?

- But that arguably reflects entailments of the structures containing the movement, rather than a unique property of movement itself.
  - There is something that can be described as *the shit* and which is an experiencer of wanting.
  - There is a unique maximal entity that the shit hit.

Idiom chunks

- If X is part of a non-compositional idiom, don't expect $[\![X]\!]$ to participate in regular semantic composition.
- *Seems* doesn't have that problem because it's a 1-place predicate which doesn't tell us anything about its subject.
- Other types of movement do. Passive: existential entailment/affectedness; question: alternative semantics.

(3) a. #The fan was hit by the shit.
b. #What did the shit hit?

- In sum, I can't see any clear current arguments against decomposition of movement from idiom chunks.

Subsection 2

Wh-dependencies which don't reconstruct enough

A′-dependencies without scope reconstruction

- Back to Lechner (1998) (and Longobardi 1985, Cinque 1990, Cresti 1995):

(4) a. How many books do you wonder whether Chris wants to buy. *many>wonder*

b. It is to her*(self)$_i$ that I don't know whether Mary$_i$ wrote.

- The present approach suggests an analysis with an A′-bound null pronoun.
- Similar devices have been used elsewhere (Cinque 1990, Aoun et al. 2001).
- Not far from the idea (Adger 2011) that minimal pronouns (with ϕ-features valued by Agree) cannot have binders outside islands: no Agree dependencies across island boundaries.
  - But other work (e.g. Guilliot & Malkawi 2006) uses resumption and movement in other ways, to describe different interactions of islandhood, reconstruction, and audibleness.

A sketch

(5) a. $[_{\mathrm{CP}}\, Wh_i \ldots\ t_i\ \ldots]$
b. $[_{\mathrm{CP}}\, Wh_i \ldots\ [_{\mathrm{Island}} \ldots\ \mathrm{pro}_i\ \ldots]]$

- Syntactic and semantic constraints on extraction from weak islands (pretty much only referential NPs) reflect specification of pro:
  - Syntactic category: NP (compare *t*, which can be whatever you like).
  - Referential (which would ideally translate into grammatically independent, cf. Adger's non-minimal pronouns in islands).
- The aim is to say that *t* in (5a) is grammatically dependent on *wh* but pro in (5b) isn't.
- Likely consequence (idea going back to Cardinaletti & Starke 1994): *t* has fewer inherent properties than (this) pro.

Summary

- Lots of open questions, perhaps unsurprisingly given the richness of what we understand by "movement".
- But a decomposition of movement into a scope chain + a binding chain + nothing else isn't obviously wrong.
  - Locality theory is increasingly unconcerned with just movement.
  - Apparently movement-specific reconstruction types are independently explicable.
  - If we see A′-dependencies without scope reconstruction, we should explore analyses with A′-bound pro rather than t.
- For the future: reconstruction is often used as a diagnostic for movement. Should it be, given the present considerations?

Section 2

Trapping and countertrapping

Movement and trapping effects

- Trapping effects are normally taken to tell us something about the interaction of scope reconstruction with binding reconstruction.
- That would make movement (scope chain + binding chain) the natural home of trapping effects.
- Turns out that's not quite accurate: although, e.g., controllers don't reconstruct for binding, they can still bind. And that binding can bleed scope reconstruction.
- Likewise, *wh*-phrases extracted from weak islands can take scope, and those scope relations may bleed binding reconstruction for some speakers.
- So (6) doesn't automatically implicate movement in reconstruction.

(6) a. Someone seemed to be dancing with every senator. $\exists > \forall, \forall > \exists$

b. Someone seemed to himself to be dancing with every senator. $\exists > \forall, *\forall > \exists$

Trapping effects without movement

- Compare reconstruction in OC complements.

(7) a. Someone wants to dance with every senator.
$\exists > \forall, \forall > \exists$

b. Someone promised himself to (be allowed to) dance with every senator. $\exists > \forall, *\forall > \exists$

- Or in extraction from weak islands:

(8) Every boy must see five pictures from his own childhood before he can go home. The teacher must oversee this process, but hasn't paid attention, so he is now unsure who has seen which pictures.

Question: %How many pictures from his_i childhood does the teacher need to know whether every boy_i has seen?

- This all suggests that trapping effects just reflect the following:

Trapping Generalization

Each constituent is interpreted in only one position.

Trapping effects and modularity

- Even this form of the trapping generalization suggests that scope and binding relations are determined at the same level of representation.
- Otherwise, we would have to operationalize the notion of "same position" across representations — not impossible (see e.g. Williams 2003), but not automatically possible.
- How to implement this isn't obvious, because scope chains look like narrowly syntactic objects, whereas binding chains look more semantic, however we sharpen the notion of "share a θ-role".

Countertrapping effects

- Interpretation of scope/binding interactions from Wednesday:

Countertrapping generalization

Individual types of reconstruction target a superset of the positions targeted by multiple cooccurring types of reconstruction

(9) weil sie [ein Bild von seinem$_{*i}$ Auftritt]$_j$ jedem Kandidaten$_i$ t$_j$ zeigte.
since she a picture of his appearance every candidate showed
'since she showed every candidate a picture of his appearance'

($\exists > \forall, \forall > \exists$, Lechner 1998:299)

- Scope reconstruction can target a position below *jedem Kandidaten*.
- Scope reconstruction + binding reconstruction cannot target a position below *jedem Kandidaten*.

Countertrapping and chains

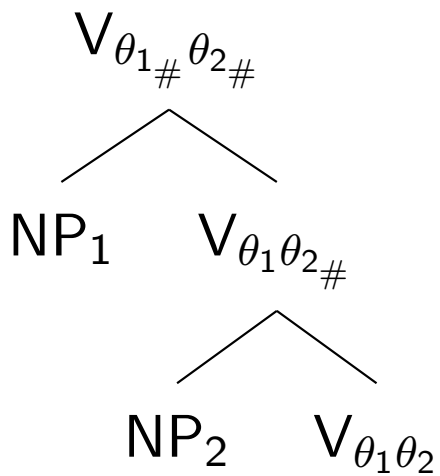
- The countertrapping generalization suggests a conception of reconstruction involving intersection of chains (sets/tuples of positions): $A \cap B \subseteq A$.

Trapping and countertrapping

- All NPs are associated with binding chains.
- All quantifiers are associated with scope chains.
- Every NP is interpreted in a position that is a member of every chain associated with that NP.

Consequences for the shape of chains

- On this approach, scrambling cannot be assimilated to A-movement (no binding reconstruction).
- There must be a member of the scrambled object's scope chain below *jedem Kandidaten*.
- There mustn't be a member of the scrambled object's binding chain below *jedem Kandidaten*.
- The obvious candidate is V (see Neeleman & van de Koot 2002 on θ-roles as grammatical dependencies).



- V and NP_1 don't "share a θ-role" if V assigns a θ-role to NP_1.

Reflexives and scope reconstruction

- Reflexives are syntactically dependent on their antecedent.
- But their binder can't reconstruct into the reflexive's position.

(10) a. I showed every teacher some students.
$\exists > \forall, \forall > \exists$

b. Some students showed every teacher a drawing
$\exists > \forall, *\forall > \exists$

c. Some students$_i$ showed every teacher each other$_i$. $\exists > \forall, *\forall > \exists$

- *Some students . . . each other* is a grammatical dependency.
  - So it should be a scope chain.
  - So all else being equal, it should allow *some students* to be interpreted in the position of *each other*.
- But *some students* and *each other* are distinct binding chains (different θ-roles).
- If *some students* binds *each other*, it must be interpreted in a position asymmetrically c-commanding *each other*.

Partial reconstruction

- Major counterexample to the Trapping Generalization as stated above: partial reconstruction.

(11) a. Which picture of himself does John like
b. Which x [John likes x picture of himself]

- Two options here:
  1. Something about freezing *à la* Rizzi (2004):
     - $C_{[+Q]}$ agrees with *which picture of himself*.
     - That guarantees an interpretation of the sentence as a question asking for a choice among pictures of himself, regardless of where NP is interpreted.
  2. Relaxing the trapping generalization so that a phrase can take scope no lower than where it's bound.
- Judgements w.r.t. the teacher example above (wide scope prevents binding within a weak island) could help choose between these two options.

Section 3

Conditions on reconstruction

Subsection 1

Binding principles

Where we are

- We now know how chains interact.
- But we only have a very rough characterization of the two types of chain.
- And we don't have a clear theory of how to determine scope and binding relations on the basis of those chains.
- Next steps:
  1. Build a chain-based theory of binding (more or less off the shelf);
  2. Build a chain-based theory of scope (more or less off the shelf);
  3. Work out how to put them together.

Chain-based binding theory (≈Barss 1986)

- For any binding chain C, $a, b \in C$ iff a and b "share a θ-role".
  - Every NP a "shares a θ-role" with itself.

A: For a reflexive a with binding chain C, some $b \in C$ is locally c-commanded by the binder of a.

A′: Something similar for pronouns interpreted as bound variables, unfortunately.

B: For a pronoun a with binding chain C, no $b \in C$ is locally c-commanded by a binder of a.

C: For an R-expression a with binding chain C, no $b \in c$ is c-commanded by a binder of a.

NPI-A: For an NPI a with binding chain C, some $b \in C$ is locally c-commanded by the licensor of a.

NPI-C: For an NPI-licensor a with binding chain C, no $b \in C$ is c-commanded by an NPI licensed by a.

Comments

- The extension to NPIs makes most sense if NPI-licensing is related to binding (Progovac 1994).
- Note the asymmetry between Principle A (existential, dependency) and Principles B–C (universal, obviation). This is now common (e.g. Lebeaux 2009)
- Reflects the idea that only Principle A is a grammatical dependency.
- This entails further interactions between scope chains and binding chains. An antecedent for a reflexive must be interpreted in a position locally c-commanding the position in which the reflexive is interpreted.

Subsection 2

Conditions on scope inversion

Definitions

- A grammatical dependency $\langle A, B \rangle$ has the following properties:
  - Node A has a feature [uF].
  - Node B has a feature [iF].
  - B c-commands A (Reverse Agree)
  - Suitable locality conditions of your choosing.
- For any feature F entering into an Agree relation, let $Path(F) = \langle x_1, \ldots, x_n \rangle$, where:
  - $\forall i > 1, \langle x_1, x_i \rangle$ is a grammatical dependency.
  - $\forall i, k, x_i$ c-commands x_{i+k}.
- I won't take a stand on whether [uF] percolates from mother to daughter (Neeleman & van de Koot 2002) or not (other, cyclic, forms of Reverse Agree). The definitions change slightly, but the ideas don't.

Scope reconstruction sites

- From this perspective, the choice between the two options (percolation from daughter to mother vs. punctuated paths) relates to the distribution of scope reconstruction.
- Danny Fox has claimed that he can construct an argument for reconstruction to any intermediate node, but I've never seen him publish the argument.
- The nearest I've seen is from Neeleman & van de Koot (2010).

(12) a. In which class (that) he_1 is taking with Ms. $Brown_2$ will Bill introduce every $student_1$ [__] to her_2 [*__]?

b. In which class (that) he_1 is taking with Ms. $Brown_2$ will Bill introduce her_2 [__] to every $student_1$ [*__]?

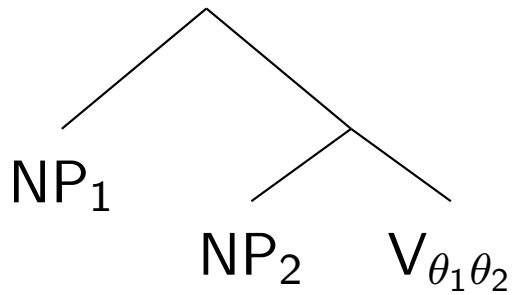
Chain-based scope inversion (cf. Hornstein 1995)

- For any feature F, $Path(F)$ defines a scope chain.
- A quantifier bearing [iF] may take scope in any position in $Path(F)$
- If X takes scope in position P_1, Y takes scope in P_2, and P_1 c-commands P_2, X takes scope over Y.

- Further questions mainly involve cases of scope freezing and what more needs to be said to capture them. Nothing insightful to say for now.

Putting scope and binding together

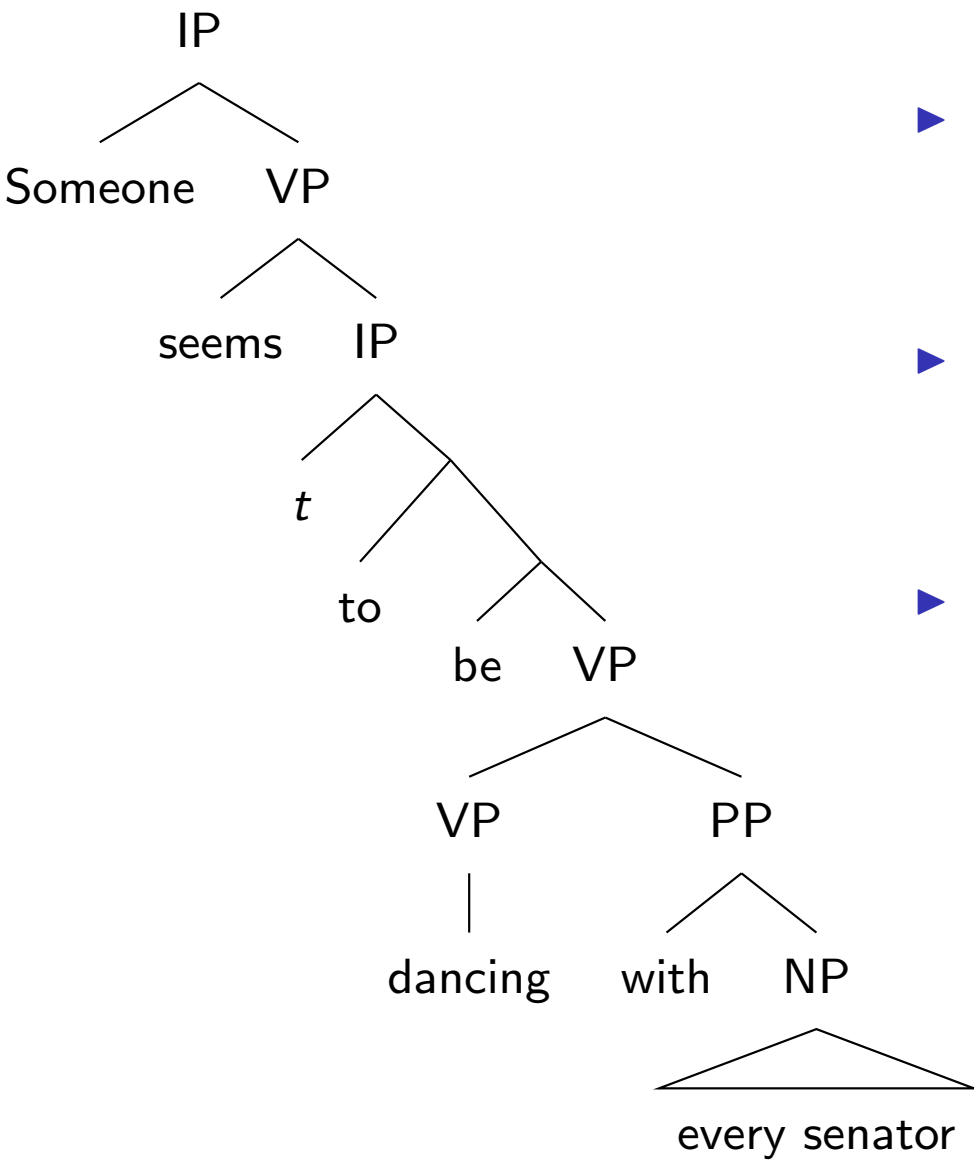
- If we assume base-generated scrambling, scope chains must include V.



$NP_2 > NP_1$

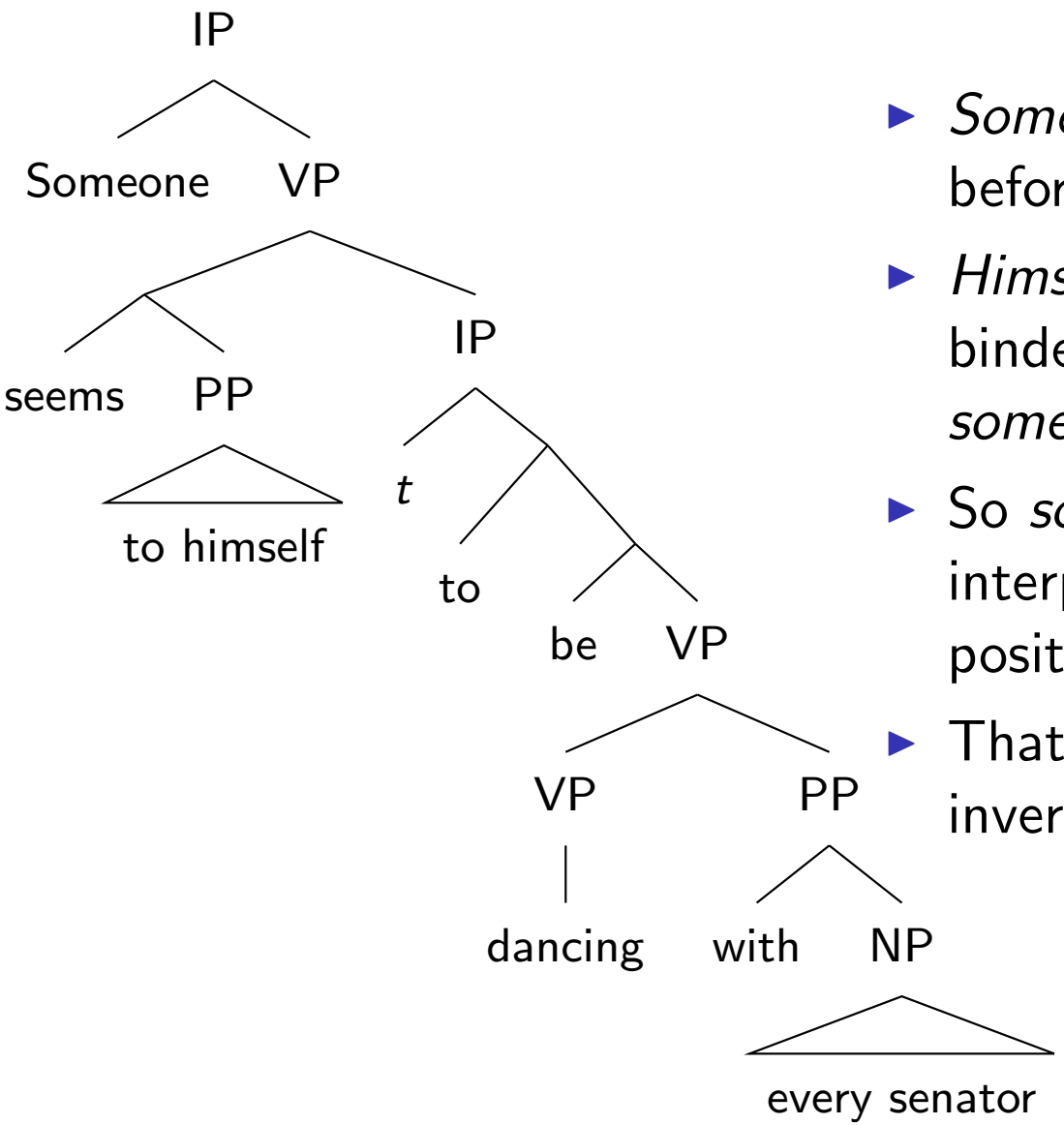
- Binding chains must not include V (NP_1 cannot bind NP_2).
- That suggests that the θ feature used by Neeleman & van de Koot in analysing scrambling is not the same as the index used in stating binding conditions.
- Tempting to suggest that binding chains are defined over a "post-syntactic", "more semantic" representation than scope chains.
- But trapping effects don't easily let us do that.
- We must assume that binding chain indices and scope chain features are present at the same level of representation.

Determining scope and binding



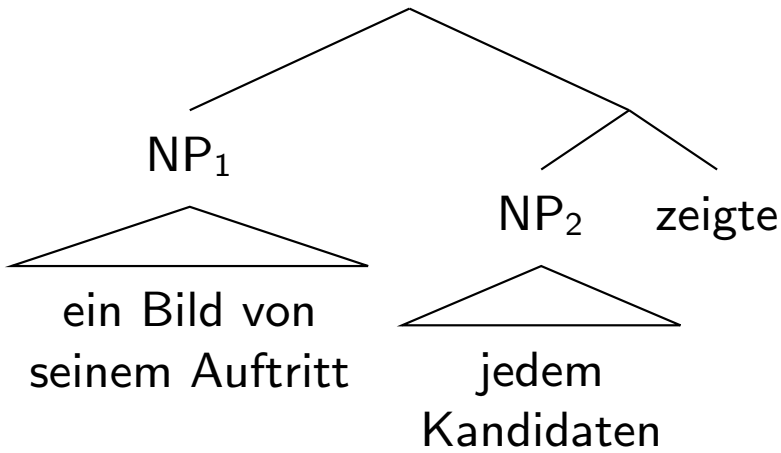
- *Someone*'s scope chain includes at least *Someone*, *t*, *dancing*.
- Binding chains are irrelevant as nothing corefers.
- Provided *(with) every senator*'s scope chain includes a member which c-commands *dancing*, we predict scope ambiguity.

Determining scope and binding



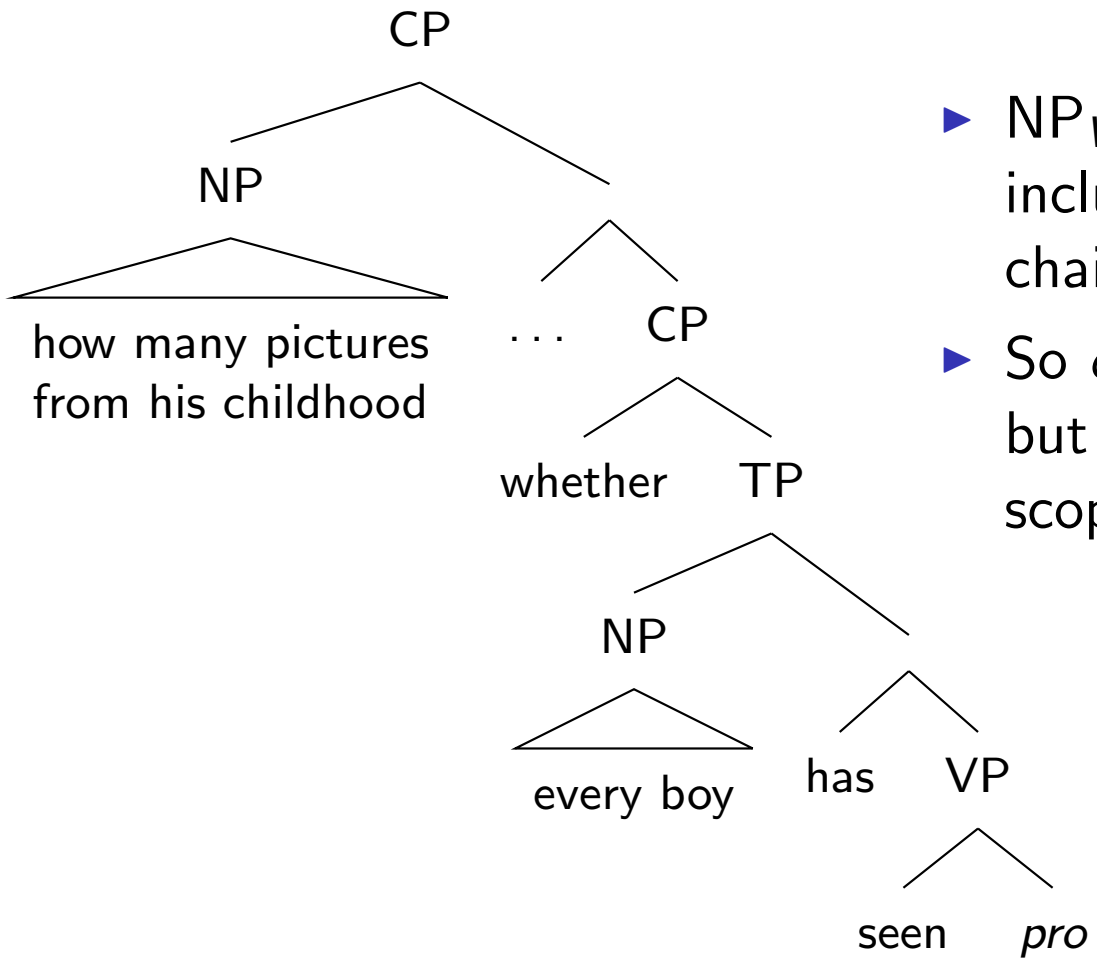
- *Someone*'s scope chain as before.
- *Himself* requires a local binder, which must be *someone* (no other choice).
- So *someone* must be interpreted in its surface position.
- That's too high for scope inversion.

Determining scope and binding



- NP_1's scope chain includes V.
- Its binding chain doesn't.
- So even though it can take scope below NP_2 if *seinem* is free, it can't be bound from such a position.

Determining scope and binding



- NP_{Wh}'s binding chain includes *pro*, but its scope chain doesn't.
- So *every boy* can bind *his*, but *many* cannot take scope below *every boy*.

Beyond this representation

- In a well-formed semantic representation, presumably quantifiers scope over propositions, and over any variables they bind.
- So the "position where a phrase takes scope and binds" as determined by scope and binding chains is not the position occupied in a semantic representation.
- Better to see the above considerations as imposing conditions on a possible semantic interpretation for a given sentence.

Summary

Coarse architectural conclusions

- Dissociations between scope reconstruction and binding reconstruction argue for two distinct types of chain, one for each type of reconstruction.
- These dissociations require that semantics be fed by a representation at which the two types of chain are visible and distinguishable.
- This argues against transformationally derived LF (QR feeds scope but not binding) and against copy theory (information about possible scope inversion and possible binding relations not distinguished).
- Nevertheless, scope chains and binding chains must be represented at the same level (trapping effects).
- And that level does not make a good semantic representation.
- So the level at which scope and binding relations are transparently reflected is not derived from S-structure by movement.

Summary

Today's loose ends

- Strong claim: there is no movement. Movement is just co-occurrence of a scope chain and a binding chain.
  - Corollary: no special conditions on locality of movement.
- Nature of the indices over which binding theory is run.
  - Related worry: can this be stated in a way which respects Inclusiveness?
  - Is there even a natural way to include these indices in syntactic representations without "prefiguring" essentially semantic relations?
- Precise characterization of scope chains w.r.t. e.g. uniform vs. punctuated paths.
- Nature of scope freezing effects.

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