

# Scope, binding, and what's beyond the surface

## 2: Scope chains and binding chains

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## From yesterday

- ▶ Lechner's double dissociation between scope reconstruction and binding reconstruction forces us to distinguish the dependencies which license scope reconstruction ("scope chains") from those which license binding reconstruction ("binding chains").
- ▶ But Lechner's additional step of having different objects in scope reconstruction positions ( $\langle \langle e, t \rangle, t \rangle$  traces) and binding reconstruction positions (copies) makes it hard to capture trapping effects (mutual determination of position of interpretation w.r.t. scope and binding).
- ▶ So we need to keep his dissociation, but have the same kind of objects as non-head members of scope chains and binding chains.
- ▶ Those objects shouldn't be copies, as copies contain too much information, which is unhelpful when you want to separate the two types of chain.

# Today

- ▶ Characterizing scope chains and binding chains by looking at further examples of Lechner's double dissociation.
- ▶ Divorcing both types of chain from movement.
- ▶ Consequences for how we think about movement.

# Section 1

## Scope reconstruction and obligatory control

## Scope inversion and obligatory control

- ▶ Sentences like (1) are scopally ambiguous.

(1) Someone tried to read every book.  $\exists > \forall, \forall > \exists$

May (1977) disagreed, but we seem to be approaching a consensus (Carlson 1977, Kennedy 1997, Neeleman & Truswell 2006, Moulton 2008, Wurmbrand 2011, Truswell 2013, Elliott & Thoms 2015)

- ▶ Obligatory control in nominals does not share this ambiguity.

(2) Someone's attempt to read every book has ended in disaster  $\exists > \forall, * \forall > \exists$

- ▶ Neither does nonobligatory control, as far as we can tell.

(3) To read every book in the library would be nice for someone.  $\exists > \forall, * \forall > \exists$

## Reconstruction or QR?

- ▶ The scope ambiguity could result from:
  1. Long-distance QR;
  2. Reconstruction (possibly plus local QR)
- ▶ I *think* the evidence favours a reconstruction analysis, but the data are very messy (and I'm in a minority).
- ▶ Two types of evidence could decide the issue (if they would just behave):
  1. Trapping: Does the ambiguity persist if we force the matrix quantifier to be interpreted in the matrix clause?
  2. Selectivity: Can the embedded quantifier scope over other matrix clause material, or just the subject?

# Trapping

- (4)
- a. Someone has promised to read every book.  
 $\exists > \forall, \forall > \exists$
  - b. Someone has promised John to read every book.  
 $\exists > \forall, \% \forall > \exists$
  - c. Someone has promised himself to read every book.  
 $\exists > \forall, * \forall > \exists$
- ▶ This would be conclusive if it weren't for Elliott & Thoms (2015) (the cause of the  $\exists > \forall, \% \forall > \exists$  in (4b)), who claim that scope inversion is blocked by overt NPs.

# Selectivity

## Arguments

- ▶ Neeleman & Truswell (2006), Truswell (2013): only the controller can take scope under the embedded quantifier.

(5) a. John persuaded someone to read every book.  
 $\exists > \forall, \forall > \exists$

b. Someone persuaded John to read every book.  
 $\exists > \forall, * \forall > \exists$

(6) a. John promised someone to read every book.  
 $\exists > \forall, * \forall > \exists$

b. Someone promised John to read every book.  
 $\exists > \forall, \forall > \exists$

- ▶ But judgement-wise, it's the wild west out there. Wurmbrand, Elliott & Thoms, and Lechner (2012) all cite different patterns, from us and from each other.

# Selectivity

## Other operators

- ▶ Neeleman & Truswell (2006), Truswell (2013): embedded quantifiers can't scope over *frequently* or *probably*.
  - (7) a. John frequently tries to check every calculation.
  - b. #John probably wants to buy every book, but it's highly unlikely that he wants to buy all five books.
  
- ▶ Elliott & Thoms (2015) offer the following:
  - (8) a. John remembered to close each window.
  - b. Jane didn't manage to solve each problem on the exam.
  - c. Jane tried twice to pass each exam that year.

General question: does *remember* > *each* entail *each* > *remember*?

## Fragile interim conclusion

- ▶ The evidence from trapping and selectivity both point towards reconstruction rather than QR as a source of scope inversion in obligatory control constructions.
- ▶ That's what I'll assume here.
- ▶ But:
  - ▶ Elliott & Thoms (2015) reduce the trapping evidence to a broader pattern where any overt NP blocks scope inversion (incompatible with (4b)).
  - ▶ Some researchers (Kennedy 1997, Elliott & Thoms 2015) have independent arguments in favour of QR.
  - ▶ A major aim of Neeleman & Truswell (2006), Truswell (2013) to say *anything* about scope inversion and control. Control theory is getting much better (Landau, Wurmbrand, work on *de se* attitudes, . . . ), so many new empirical questions have arisen that I haven't (yet) had time to address.
- ▶ No-one has a clear picture of control and scope right now, so I'm setting up a hostage to fortune. I hope the rest of the position justifies doing so.

# Action item 1

- ▶ Could someone please sort this out?
  - ▶ What are the really diagnostic examples?
  - ▶ What are the facts about those examples?
  - ▶ Which quantifiers are most revealing (e.g. *each* vs. *every*)?
  - ▶ Are there distinctions between different types of control predicate?

## Something we can all agree on

- ▶ No evidence of reconstruction for anything else.
- ▶ E.g. bound variable anaphora.

- (9) a. Her friends seem to every girl to be wonderful.  
b. Her friends promised every girl to meet her after school.

- ▶ Or NPI-licensing

- (10) A doctor with any knowledge of acupuncture seemed/\*wanted not to be available.

- ▶ Or idioms

- (11) The chickens seemed/\*tried to come home to roost.

- ▶ So obligatory control, A-scrambling, and regular movement all allow scope reconstruction, but OC and A-scrambling don't allow other reconstruction.

## Sorry, Norbert

- ▶ Natural response: “Oh, there’s reconstruction into OC complements. That’s good news for the Movement Theory of Control (Hornstein 1999, Boeckx et al. 2010)”.
- ▶ No.
- ▶ The litany of reasons why control is not movement (starting with Culicover & Jackendoff 2001 and Landau 2001) is not worth repeating here.
- ▶ But even without those reasons, controllers don’t reconstruct *in the same way* as raised NPs. Reducing one type of dependency to the other would only offer a partial solution.
- ▶ (And the fact that they show different reconstruction patterns may constitute another argument against the MTC).

## Commonalities among dependencies with scope reconstruction

- ▶ Obligatory control and movement have different properties.
- ▶ But they are both types of syntactic dependency, as characterized by the **configurational matrix** (Koster 1987, Neeleman & van de Koot 2002):
  - ▶ Unique antecedent;
  - ▶ Obligatory antecedent;
  - ▶ Locality;
  - ▶ C-command.
- ▶ Some people (Neeleman 1994, Bayer & Kornfilt 1994, Fanselow 2001) have suggested that A-scrambling is also a non-movement grammatical dependency.
- ▶ At least one syntactic dependency (reflexive binding) doesn't show scope reconstruction. We'll see why tomorrow.
- ▶ So, **Claim 1**: Grammatical dependencies license scope reconstruction.
- ▶ Or: Scope chains are related to grammatical dependencies.

## Control in nominals

- ▶ Simple-minded implementation of the above idea: OC PRO is a syntactically dependent element (like *-self* or A-trace).
- ▶ (NOC PRO is clearly independent as it doesn't need an antecedent).
- ▶ But we saw that there is no scope reconstruction across OC dependencies in nominals.
- ▶ Control in nominals also doesn't fit with the Configurational Matrix (see e.g. Williams 1985):

(12) The attempt to leave (on the part of John)

- ▶ Conclusion: the grammatical dependency which licences scope reconstruction is not between PRO and antecedent, but between PRO and something verbal.
- ▶ This fits nicely with some theories of control (especially Landau 2001), but less so with others (e.g. Landau 2015).

## Section 2

### Binding reconstruction in specificational sentences

## Specificational vs. predicational

- ▶ Two types of copular construction (Akmajian 1970, Ross 1972, Higgins 1973):

(13) a. What John<sub>i</sub> is is a danger to him<sub>i</sub>.

PREDICATIONAL

- ▶ John is a lion tamer. John's being a lion tamer is a danger to him.
- ▶ No binding relation between pre-copular and post-copular material.

b. What John<sub>i</sub> is is a danger to himself<sub>i</sub>.

SPECIFICATIONAL

- ▶ John is a danger to himself. That's what he is.
- ▶ Full range of binding relations between pre-copular and post-copular material.

## Binding effects in specificational sentences

- ▶ Reciprocal binding

(14) What they did was kiss each other.

- ▶ Variable binding

(15) What no teenage boy<sub>i</sub> wants is his<sub>i</sub> comfort blanket.

- ▶ Principle B

(16) What John<sub>i</sub> is is a danger to him<sub>i</sub>.  
(predicational only)

- ▶ Principle C

(17) What he<sub>i</sub> is is a danger to John<sub>i</sub>. (predicational only)

- ▶ NPI-licensing

(18) What I have never noticed is any signs of unease

## Variants

- ▶ Precopular material is typically a definite description, but it doesn't have to be a free relative and doesn't have to contain a gap.

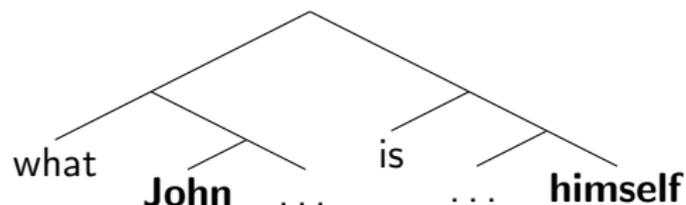
- (19)
- a. John's worst enemy is himself.
  - b. \*His<sub>i</sub> biggest indulgence is a statue of John<sub>i</sub>;

- ▶ Most reconstruction effects persist if precopular and postcopular material is swapped (**inverse specificational sentences**, Sternefeld 1997, den Dikken et al. 2000)

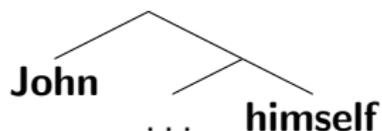
- (20)
- a. A danger to himself is what John is.
  - b. \*A danger to John<sub>i</sub> is what he<sub>i</sub> is.

## This shouldn't be happening

- ▶ This is surprising because of the absence of surface c-command.



- ▶ The usual approach to these **connectivity** effects is to recreate the c-command at some level of representation.



- ▶ We disregard approaches based on specification as inverse predication (Williams 1983, 1994, Partee 1986), because they don't obviously get us closer to understanding how to do this.

# Where does the c-command hold?

I: WYSIWYG

- ▶ Akmajian (1970): D-structure
  - ▶ [[What John is a danger to himself] is  $\Delta$ ]
  - ▶ Requires movement to a non-c-commanding position.
  - ▶ Requires trace bound by *what*, not the moved element.
  - ▶ Source D-structure not always obvious (cases with no precopular trace; also *What I like about John is his sense of humour*, Higgins 1973)
- ▶ Bošković (1997): LF (Akmajian in reverse)
  - ▶ Inherits similar problems.
- ▶ Heycock & Kroch (1999): After LF ( $\iota$ -reduction)
  - ▶ ( $\iota x$ .(John's biggest problem( $x$ )) = himself)  $\rightarrow$  John's biggest problem(himself)
  - ▶ Avoids these problems by not relying on movement.
  - ▶ But *sui generis* insofar as we don't have a broader understanding of post-LF structural manipulations.

# Where does the c-command hold?

## II: With ellipsis

- ▶ Ross (1972), Schlenker (2003):

(21) What John is is ~~John~~ is a danger to himself

- ▶ More likely, à la Merchant (2004):

(22) What John is is [[a danger to himself] ~~John is  $t$~~ ]

- ▶ Making semantic sense of the copula:

- ▶ Precopular definite description is a concealed question.
- ▶ Either adopt an approach according to which questions denote propositions, or assume a covert answerhood operator.

(23) a. ANS (Concealed question) =  $P$   
b. The answer to the question of what John is is  
John is a danger to himself.

- ▶ So then the c-command holds wherever you want it to (LF, S-structure, ...)

# Criticism of the ellipsis approach

## No unconcealed questions

- ▶ The precopular material cannot take the form of a nonconcealed question.  
  
(24) a. \*Which problem John is wrestling with is himself.  
b. ?Which problem John is wrestling with is John is wrestling with himself.
  
- ▶ The precopular material can be modified by an appositive; questions cannot (den Dikken 2005).  
  
(25) a. \*What is John spending all his money on, which shouldn't cost so much?  
b. What John is spending all his money on, which shouldn't cost so much, is an unnecessary amount of fancy shoes.
  
- ▶ This aside, concealed questions are found in a proper subset of the environments in which unconcealed questions are found.

# Criticism of the ellipsis approach

## Unacceptable “answers”

- ▶ (From unpublished work by Caroline Heycock and Tony Kroch:)

(26) a. What did she buy? Nothing.  
b. \*What she bought was nothing.

(27) a. Who can help you? Only John.  
b. Who can help you is (\*only) John.

- ▶ Conclusion: the questions aren't questions and the answers aren't answers.
- ▶ The “short-form” specificational sentences aren't always reducible to the “long-form” specificational sentences.
- ▶ Further conclusion: the connectivity effects aren't (yet) demonstrably derivable from ellipsis.
- ▶ So neither the WYSIWYG approach or the ellipsis approach has yet provided a really satisfying configurational account of binding reconstruction in specificational sentences.

## No scope reconstruction in specificational sentences

- (28) a. Every factual error in the BBC's science reporting bothers at least one friend of mine.  $\exists > \forall, \forall > \exists$   
b. At least one friend of mine saw every factual error ...  $\exists > \forall, \forall > \exists$
- (29) a. What bothers at least one friend of mine is every factual error in the BBC's science reporting.  $\exists > \forall, * \forall > \exists$   
b. What at least one friend of mine saw is every factual error ...  $\exists > \forall, * \forall > \exists$
- (30) a. Among the things that bother at least one friend of mine is every factual error in the BBC's science reporting. ???  
b. Among the things that at least one friend of mine saw is every factual error ... ???

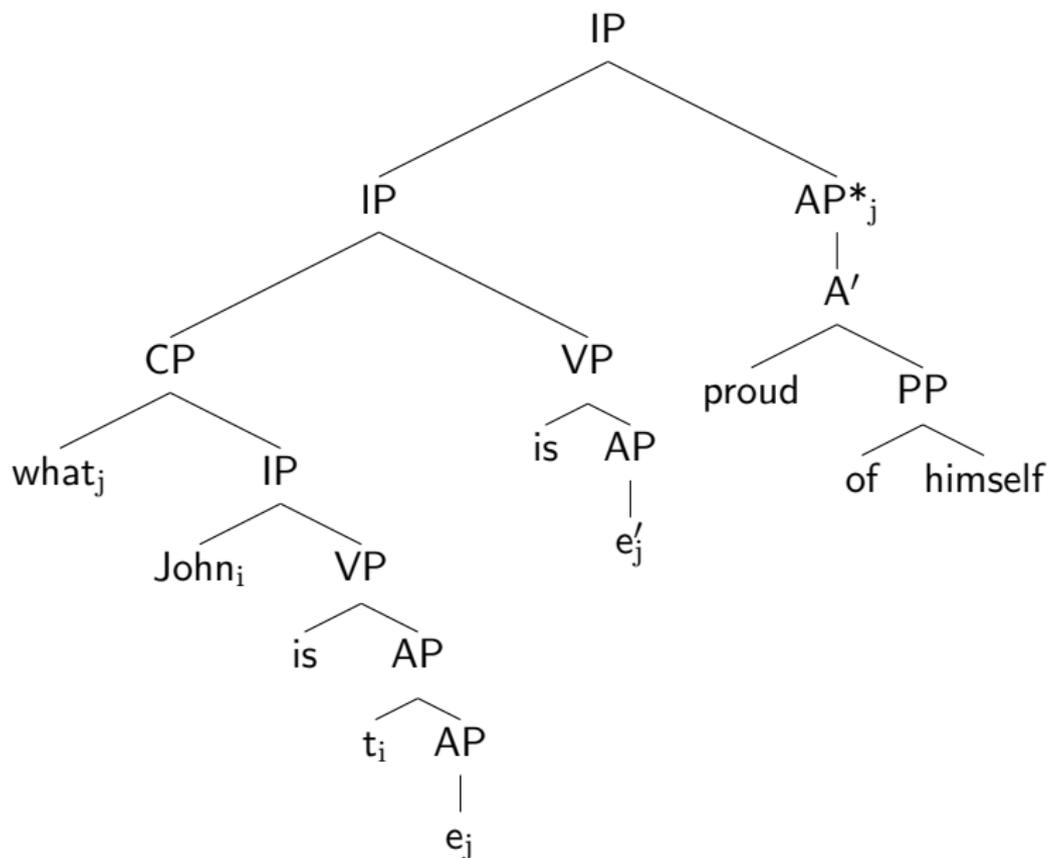
## No scope reconstruction in specificational sentences

- ▶ “But that’s just something to do with definite descriptions and copulas or something” .
- ▶ Yes, probably. But that’s the point.
  - ▶ The WYSIWYG approaches above aim to reconstruct a simple sentence from this copular construction, and run binding theory over that. The scope facts show that’s not enough.
  - ▶ The ellipsis approaches might be able to do more than that, but seem to be ruled out for other reasons.
- ▶ So specificational sentences have complementary reconstruction behaviour to OC and A-scrambling.
- ▶ They show the same behaviour as extraction from weak islands.

## Barss (1986)

- ▶ When Barss (1986) more-or-less invented the copy theory, he remarked that it was “empirically equivalent to the chain accessibility sequence framework” (pp.273–4)
- ▶ But later (pp.310–5), he shows implicitly that they’re not: nothing forces you to define chains exclusively in terms of movement.
- ▶ He constructs an analysis of binding in specificational sentences that makes reference to non-movement chains.
- ▶ Three-part strategy:
  1. Insist on c-command among members of chains;
  2. Extrapose postcopular material to a position c-commanding precopular material (and presumably move to somewhere left-peripheral in inverse specificational sentences), and form a chain.
  3. Define binding conditions over such chains.

## A Barss tree

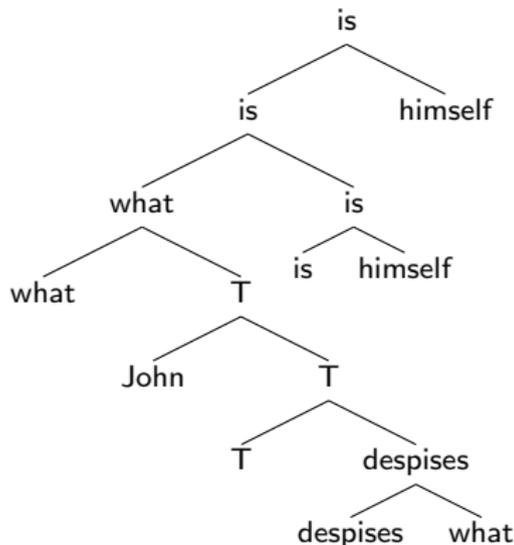


(Barss 1986: 310)

## Principle C

- ▶ Push at this analysis, and it starts to creak a little.

- (31)
- What John despises is himself.
  - Himself is what John despises.
  - What the twins saw is each other.
  - ??Each other is what the twins saw.



## Bare NPIs

- ▶ You could argue that some null structure (*X himself*) breaks c-command between *himself* and *John*.
  - ▶ So long as you somehow avoid predicting that [[*X himself*] loves *John*] is OK
- ▶ But there's another reflex of the same pattern. Den Dikken et al. (2000): no NPI-licensing in inverse specificational sentences.

(32) \*Any wine was what nobody brought.

- ▶ Heycock & Kroch (2002): the restriction only applies to bare NPIs.

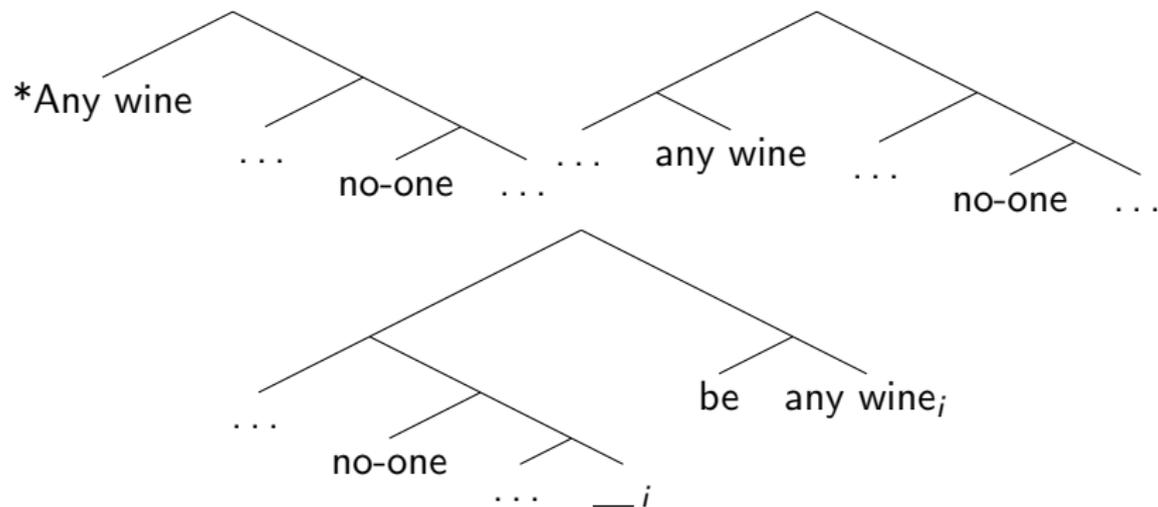
(33) A bottle with any wine in it is what nobody brought.

- ▶ And in regular specificational sentences, there's no difference.

(34) What nobody brought was any wine.

## Distribution of NPIs

- ▶ One way to make sense of this:
  - ▶ NPIs must form a chain with an element within the scope of an NPI-licensor (*cf.* Principle A).
  - ▶ NPI-licensors don't like to be c-commanded by NPIs (*cf.* Principle B).



## Consequences

- ▶ Surface distribution of NPIs is a lot like surface distribution of reciprocals.
- ▶ It seems to be captured by conditions on surface c-command.
- ▶ That suggests that *Himself is what John despises* is just *himself* being weird, again.
- ▶ Barss' extraposition (with a view to establishing c-command among members of chains) probably causes more problems than it solves.
- ▶ That aside, we're backed into a corner:
  - ▶ Focused material is interpreted w.r.t. binding theory inside the definite description.
  - ▶ But it doesn't need a trace there.
  - ▶ It isn't related to a suitable position by movement.
  - ▶ It doesn't even necessarily c-command such a position.

## Binding chains

- ▶ Binding chains need not be grammatical dependencies in the sense of the Configurational Matrix (no c-command).
- ▶ They typically involve positions that “share a  $\theta$ -role”.
- ▶ This is the intuition between Heycock & Kroch's (1999)  $\iota$ -reduction.
  - ▶  $\iota y$ . [Fiona bought  $y$ ] = that ancient dictionary
  - ▶ Fiona bought that ancient dictionary AND  
( $\forall z$ )(Fiona bought  $z$  iff  $z \leq$  that ancient dictionary)  
(Heycock & Kroch 1999: 388)
- ▶ The same is true of all other cases that allow binding reconstruction (extraction from weak islands, regular movement).
- ▶ I can't literally mean “share a  $\theta$ -role”, though.

## So what do I mean?

- ▶ Reasons why “share a  $\theta$ -role” is an insufficient characterization:

- ▶ How many  $\theta$ -roles does *problem* have?

(35) John's biggest problem is himself.

- ▶ Similar effects with adverbial material.

(36) Where the twins had their out-of-body experiences was next to each other.

- ▶ An alternative would be “positions relatable by  $\iota$ -reduction”.

- ▶ Though this will cause lookahead problems when we try to build a theory of the syntax of scope and binding tomorrow.

- ▶ It also seems overly permissive:

(37) The twins' ??(biggest) problem is each other.

## So what do I mean?

- ▶ It may be significant that copular constructions don't assign  $\theta$ -roles.
  - ▶ If you disagree, think about what  $\theta$ -roles they assign.
  - ▶ Bear in mind (esp. w.r.t. equatives) that  $\theta$ -roles are usually unique.
  - ▶ Also bear in mind that nonarguments and categories other than NP can occur in these positions.
- ▶ I also think the notion I'm looking for is linked to the information structure of specificational sentences (see also Heycock & Kroch 2002)
- ▶ I want to articulate the intuition that the postcopular position is  $A'$ -like (non- $\theta$ -related focus position), and that drives a lot of its reconstruction behaviour.
- ▶ But I can't sharpen this at present.

## Section 3

Back to movement

## 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.

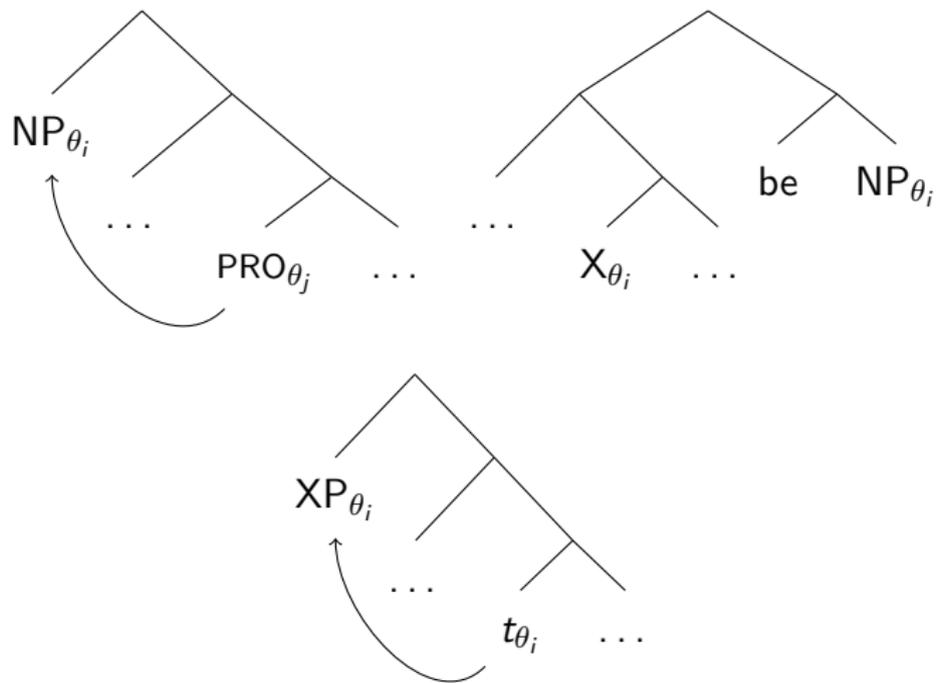
## In other words

- ▶ If movement = scope chain + binding chain, movement is a grammatical dependency between elements which “share a  $\theta$ -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.

## 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  $\theta$ -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't promise that this is viable. I'd like opinions.
- ▶ I can see two major reasons why it 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”.
- ▶ Instead 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).
- ▶ Koster’s (1987) own take was that locality of movement was a special case of locality of grammatical dependencies.
- ▶ In sum, the potential challenge here doesn’t worry me.

# Summary I

- ▶ We have candidates for other examples of Lechner's two types of reconstruction.
  - ▶ Obligatory Control patterns with short scrambling.
  - ▶ Specificational sentences pattern with extraction from weak islands.
- ▶ This allows slightly more precision about the nature of scope chains and binding chains.
  - ▶ Scope chains have something to do with grammatical dependencies in the configurational matrix sense.
  - ▶ Binding chains have something to do with “sharing a  $\theta$ -role”.
- ▶ An advantage of this over Lechner's approach is that it doesn't commit us to different elements in scope and binding reconstruction sites, which will help us to handle trapping effects.

## Summary II

- ▶ Both of the constructions considered today look a bit like movement, but cannot be reduced to movement. This militates against a narrow definition of chains in terms of movement-related paraphernalia.
- ▶ But divorcing chains from movement leads to a new possibility: movement can be dissolved into multiple co-occurring but dissociable relations.

## Matters arising

1. What about Lechner's original examples? Can they be analysed without movement?
2. What conditions regulate scope inversion and binding relations under this system (i.e. what does this part of the interface actually look like)?
3. Other constructions with interesting reconstruction profiles?
4. Other types of reconstruction?
5. Other grammatical dependencies: do they all allow scope reconstruction?

Tomorrow: prospects for answering at least some of these.

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