# QR across finite CP: *de re* readings, binding and VP-ellipsis

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In the following, I look at two types of evidence - (i) antecedent contained deletions (ACDs), and (ii) *de re-de dicto* ambiguities - bearing on LF-extraction ("QR") of constituents out of finite complements governed by believe-type verbs. I suggest that *de re* readings for embedded adjuncts (1) be treated in terms of LF-movement (QR). Binding evidence supports this view. The analysis extends to *de re* readings for comparative clauses (2). *De re* readings thus supplement the evidence for "long QR" of provided by wide scope ACDs, as in the comparative (3): [1]

(1) John thinks Mary left before she did (leave)
(2) John thinks Mary is taller than she is.
(3) John thinks Mary is taller than Bill does

## 1. "Long QR"

### 1.1 ACDs: wide scope VP-Ellipsis vs. absence of scope ambiguities

"Wide scope" readings of elided VPs (VPEs) in ACD contexts - e.g. (4) - provide evidence that subjects (and other constituents) can raise out of finite clauses in the LF-component: [2]

(4) a. John believes that everyone is intelligent that Mary does
b. John believes that everyone is intelligent that Mary does *believe t is intelligent*

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[1] These notes presuppose the discussion in Wilder (1995). Following the line pursued in May (1985) etc., the interpretation of a VP ellipsis site is assumed to be determined by its formal syntactic properties, i.e. on the basis of the constituents dominated by the VP-node at LF. The precise mechanism by which the ellipsis site gains its syntactic content is not at issue here. Two contenders are (i) "base-generated empty VP": the contents of a VPE are 'reconstructed' from its antecedent via copying after S-structure (May 1985, Fiengo & May 1994); (ii) "PF-deletion": the contents of a VPE are 'base-generated', hence present throughout the syntactic derivation, and deleted under 'identity' with the antecedent only in the PF-component (Chomsky 1992). Under (ii), a VPE underlies a requirement that it be 'identical' (or 'parallel') with its antecedent at LF. The discussion here is consistent with either approach. The claim that is crucial here, is that a VPE may not be dominated by its antecedent VP at LF. Under (i), copying would lead to 'infinite regress'; under (ii), identity could not be achieved, since the VPE would always contain at least one depth of embedding less than its antecedent.

[2] This type of example, involving a VPE in a relative clause extraposed from the embedded subject, was first discussed in Tiedemann 1995, and Lasnik 1995.

The fact that (4a) has the reading indicated can be accounted for as follows (Wilder 1995). After 'Spell-Out', the relative clause is "reconstructed" into the subject DP (5a). That DP then raises out of the finite clause (5b). The VPE is no longer contained in the matrix VP, and so may take this VP as its antecedent at LF (5c):

(5) a. John believes [everyone that Mary does *vp* ] is intelligent
b. everyone that Mary does *vp* [John believes [ *t* is intelligent ]]
c. everyone that Mary does *believe t is intelligent* [John [$_{VP}$ believes t is intelligent]]

The movement (5b) is QR, playing the same role as in May's (1985) account of ACDs. However, the analysis (5) dictates that - contra May - QR can affect the subject of a finite complement clause. [3] Call the case where raising crosses a finite CP "long QR" (LQR).

As is well known, quantifiers in finite complements (as opposed to e.g. ECM-complements) normally do not interact scopally with quantifiers in the matrix. Thus (6a) contrasts with (6b):

(6) a. Someone believes that everyone is a genius ok: ∃∀ / * ∀ ∃
b. Someone believes everyone to be a genius ok: ∃∀ / ok: ∀ ∃

We might expect an expression that undergoes LQR, determined by wide scope VPE, to interact scopally with expressions of the higher clause, but such effects are not found. Adding a relative clause that modifies the lower subject and contains a wide scope VPE does not alter the pattern of (6) - *everyone* cannot take scope over *someone* in (7):

(7) Someone believes that everyone is a genius that Mary does ok: ∃∀ / * ∀ ∃

Why should standard QR (i.e. short QR not crossing a finite CP) permit scope ambiguities, while LQR does not? I return to this question below, sect. 5.3. [4]

The asymmetry might be seen as casting doubt on the assumption of LQR. Since LQR does not give rise to scope ambiguities, the only reason to assume LQR would be the account

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3 Fiengo & May (1994:257) note examples of wide scope VP-ellipsis, but none that would require QR of an embedded subject.

4 It is important to realize that the absence of the inverted scope reading in (7) is not inconsistent with the assumption of LQR (cf. Wilder 1995). Scoping of *everyone* over *believe* is in fact necessary to give the correct reading, which is (i), and not (ii). The latter is a possible reading for the 'undeleted' version of (7), i.e. (iii):
(i) ∃y ∀x : [believe(m) [genius(x)]] → [believe(y) [genius(x)]]
(ii) ∃y : believe (y) [∀x : [believe(m) [genius(x)]] → [genius(x)] ]
(iii) Someone believes that everyone is a genius that Mary believes is a genius.

it permits for wide-scope VPE in ACD contexts. If an alternative could be found to the LQR-based analysis of (4), then maybe LQR does not exist.

### 1.2 ACDs: LQR vs. extraposition

The LQR-analysis (5) is not the only possibility for handling the resolution of the ACD in (4). The problem posed directly by ACDs is the antecedent-containment itself. The minimal requirement is that the VPE itself is extracted from its antecedent before it can be interpreted (via copying, identity checking, or whatever). The QR analysis serves this purpose. But any movement which leads to raising of the VPE would suffice. An alternative is that wide scope VPE is licensed not by QR of the DP everyone + relative clause, but by extraposition of the relative clause (cf. Baltin 1987). [5] (4) would have the S-structure (8):

(8) [ John [$_{VP}$ believes that [everyone ($t_{CP}$) ] is intelligent $_{VP}$] [$_{CP}$ that Mary does _ ] ]

Notice that this analysis must assume that the Right Roof constraint, or whatever underlies it, is neutralized in such examples.

However, extraposition alone does not ensure that ACDs are assigned the correct interpretation - e.g. (9) for (4) - without the additional assumption that QR (or an equivalent) applies to *everyone* (cf. Larson & May 1990). The relative clause containing the VPE must be interpreted in the scope of *everyone* - e.g. by forming the antecedent of the conditional in (9):

(9) $\forall x$ believe(mary,(intelligent(x)) $\rightarrow$ believe(john,(intelligent(x))

So wide scope VPE in ACD contexts seems to entail LQR anyway, whether it is LQR itself, or extraposition, that licenses wide scope VPE.

The only issue then is whether LQR itself is responsible for wide scope ACD resolution, or whether it merely 'shadows' another operation (e.g. extraposition), with the latter being responsible for ACD resolution.

The account of wide scope ACDs in terms of LQR (5) presupposes that QR targets more than just the quantifier *everyone*, i.e. that the relative clause is 'pied-piped' under QR. Below, evidence independent of ACDs is provided to support the claim that LQR exists, and that it involves raising of whole phrasal constituents out of finite complements. To the extent that this evidence is compelling, the analysis of ACD resolution in terms of LQR is supported.

### 1.3 Temporal adjuncts: wide scope ACDs vs. *de re* readings

Temporal adjuncts do not permit wide scope ACDs. Matrix or embedded attachment for the adjunct and wide/narrow scope for the VPE should give (10) four readings, i.e. (11a-d). Only three of these exist.

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[5] For argument against an extraposition approach to ACDs, see Larson & May (1990), Hornstein (1994).

(10) John said that Mary would arrive before Peter did.

(11) a. [[John said that Mary would arrive] before Peter did *arrive*]
b. [[John said that Mary would arrive] before Peter did *say that Mary would arrive*]
c. John said that [[Mary would arrive] before Peter did *arrive*]
d. * John said that [[Mary would arrive] before Peter did *say that Mary would arrive*]

Wilder (1995) suggested because of this paradigm that temporal adjuncts do not undergo LQR. If the adjunct could undergo LQR, the missing reading (11d) would be expected to exist.

However, other data indicate that a covert movement operation like LQR is available for temporal adjuncts. Lappin (1993:267) notes (in passing) that in (12), the before-adjunct has undergone QR out of its clause:

(12) the book which Mary thinks she reviewed before she could have _

His motivation for saying this is presumably as follows: the adjunct (which modifies reviewed in the complement of thinks) receives a *de re* reading with respect to Mary thinks; for the *de re* reading to be possible, the before-adjunct must be assumed to have raised out of the complement clause. In the next section, I explore the idea that this operation is LQR (without implying that the before-adjunct itself is to be treated semantically as a quantificational expression). Such an analysis for temporal adjuncts has been suggested by Larson (1987:260-262, esp. footnote 21).

In §7. I seek to square (11d) with (10), by showing that (11d) is ruled out by independent factors, so that the paradigm says nothing about whether temporal adjuncts can undergo LQR.

## 2. *De re* readings of temporal adjuncts and *than*-clauses

### 2.1 Getting the readings

Consider a simplified version of Lappin's example: [6]

(13) Mary thinks she$_j$ reviewed this book before she$_j$ could have

The most accessible reading is one in which the constituent headed by *before* modifies the lower verb (*reviewed*), but in which the content of that constituent is not treated as part of Mary's thought. We might represent that reading as in (14a):

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[6] Lappin is concerned with the parasitic gap contained in the VPE in (12), which is irrelevant here.

(14) a. [$_{IP2}$ Mary thinks [$_{IP1}$ she reviewed this book at time t ] &
[$_{PP}$ t < t', t' s.t. she could have reviewed this book only at time t'
(or later, not earlier) ] ]

b. [$_{IP2}$ Mary thinks [$_{IP1}$ she reviewed this book at time t &
[$_{PP}$ t < t', t' s.t. she could have reviewed this book only at time t'
(or later, not earlier) ] ] ]

There is an alternative reading in which the temporal adjunct modifies *reviewed*, but in which the content of that constituent is treated as part of Mary's thought (14b). This latter reading is an absurd reading (noted #): it attributes an absurd (contradictory) thought, i.e. (15), to Mary:

(15) # I reviewed this book before I could have

So (13) is ambiguous between a sensible reading like (14a) and an absurd reading (14b). This is a classic example of a *de re* / *de dicto* ambiguity found with believe-type verbs: in the sensible reading (*de re*), PP is not part of Mary's thought (=IP2), i.e. *de re* w.r.t thought; in the absurd reading, PP is part of Mary's thought (=IP2), i.e. *de dicto* w.r.t thought.

Ambiguities of this sort can be viewed as a matter of "scope" ("sequence of interpretation"). For PP to be interpreted *de dicto* w.r.t thought, PP is interpreted in the scope of thought (as part of the complement of thought, before that verb and its complement are interpreted). For PP to be interpreted *de re* w.r.t thought, PP is interpreted outside the scope of thought (after thought and its complement are interpreted).

(13) is complicated by the presence of the modal. Simpler cases (16) have equivalent structure, i.e. (16a) only has an absurd reading, while (16b) - restricting attention to the case where the temporal modifies *left*, not *said* - has a *de re* (sensible) reading, and a *de dicto* (absurd) reading that attributes (16a) to Mary:

(16) a. # I left before I did (leave)
b. John said Mary$_j$ left before she$_j$ did (leave)

Similar in structure are comparatives of the type (17), taken up in Stechow (1984), who traces their discussion back to Russell (1905): [7]

(17) a. # John$_j$ is taller than he$_j$ is

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[7] Larson (1987:262, note 21) briefly notes these examples, suggesting an LQR-analysis. He also observes that temporal adjuncts are more closely related to comparatives than at first sight appears, with before = earlier than, after = later than, when = as early as, etc., and each permitting the same range of ellipsis types in the complement clause:
(i) John arrived {before; earlier than} Sam arrived / did / ∅.

b. Mary thinks John$_j$ is taller than he$_j$ is

The advantage of these paradigms (*de re* -sensible, *de dicto* - stupid) is that they provide clear intuitions about scope relations, so that scope effects are easier to control for when testing other properties. [8]

## 2.2 *De re* at LF

Suppose that the ambiguity of (16b, 17b) is represented structurally in LF-representation. Then in the sensible (*de re*) reading, the *before-* (or *than-*) clause is outside the scope of V, i.e. outside the finite complement of V. The absurd (*de dicto*) reading arises if the *before/than* clause is inside the complement clause. Under such an approach, (13) is associated with 2 different LFs - cf. (14). Similarly for (16b): [9]

(18) a. [$_{IP2}$ John said [$_{IP1}$ Mary left at time t ] & [$_{PP}$ t < t', t' s.t. Mary left at time t' ] ]
= *de re*

b. [$_{IP2}$ John said [$_{IP1}$ Mary left at time t & [$_{PP}$ t < t', t' s.t. Mary left at time t' ] ] ]
= *de dicto*

The comparative can be handled similarly. The sensible reading of (17b) is paraphrased by (19b), the absurd reading of (17a) (*de dicto* in (17b)) as (19a):

(19) a. the degree to which John is tall is greater than the degree to which John is tall

b. the degree to which Mary thinks John is tall is greater than the degree to which John is tall

Suppose that the *than* clause is an (extraposable) complement to a head Deg° = *more* (*-er*). To capture the *de re* reading, I suppose that the DegP (or a phrase containing DegP) undergoes QR. Hence, different LFs can provide a structural basis for distinguishing *de re* and *de dicto* readings:

(20) a. Mary thinks that [$_{IP2}$ John is d-tall & [$_{DegP}$ d>d'(*more*) &(*than*) he is d'-tall ] ]

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8 There is an independent puzzle in (16), namely, why it is that (16a) blindly gets the absurd reading it does. There is a non-absurd reading in which I can leave, come back and leave a second time: but that is only accessed when the two occasions are explicitly referred to: I left **once** before I left **again**. With (17a), there is no puzzle - absurdity derives from the fact that an individual can have only one height at one time.

9 These and similar 'LFs' are intended to be informal, merely indicating relevant scope relations. No significance should attached to linear order. "Event times" (t, t') and "degrees" (d, d') are treated as constants to keep things readable. The syntax and semantics of comparatives is glossed over here for the usual reasons. For useful discussion cf. Stechow (1984).

b. $[_{IP1}$ Mary thinks that John is d-tall ] & $[_{DegP}$ d>d' & he is d'-tall ] =*de re*

Stechow (1984) discusses two ways of handling such *de re-de dicto* ambiguities in "Russell sentences". One solution ("scopism") is essentially the one just presented - structural differences in the representations to be interpreted. The alternative ("double indexing") makes use of a special modal operator that permits direct reference to "the actual world". Use of this alternative allows *de re / de dicto* ambiguities to be captured without structurally different LFs: *de re* readings can be got from interpreting than-clauses in situ.

Suppose that LFs of finite clauses contain "world variables". The content of the clause is evaluated w.r.t. the "world" picked out by the world variable (w) (→ "possible world semantics"). In an indicative root clause, w refers to the "actual" world. In the complement clause of a believe-type verb, w is interpreted w.r.t the belief-world of the referent of the matrix subject. Suppose that in a than-clause contained in a belief-complement, w can be bound by a special operator (ACTUALLY) that ties the world-variable it binds to the actual world. Then the content of the than-clause is evaluated w.r.t the "actual world" (21b). If ACTUALLY is not present, the than-clause is evaluated w.r.t. the belief-world of the complement clause containing it (21a):

(21) a. M. thinks $[_{IP2}$ J. is d-tall in w & $[_{DegP}$ d>d' & he is d'-tall in w ]] (=*de dicto*)
b. M. thinks $[_{IP2}$ J. is d-tall in w & $[_{DegP}$ d>d' & ACTUALLY (he is d'-tall in w) ]]

In the "double-indexing" soliution, exploiting world-variables and the ACTUALLY operator, the *de re* reading arises as the result of intepreting the than-clause in situ. Hence, LQR - i.e. "scoping-out" the than-clause - can be dispensed with. This solution will work in the same way with before-adjuncts, I assume.

Stechow provides one argument against the scope solution. He argues that a proper treatment of the behaviour of "Russell sentences" like (17b) embedded in counterfactual conditionals (22), necessitates the assumption of the ACTUALLY operator:

(22) If Bob had been taller than he was, he would have made the team.

While the antecedent of the conditional (Bob had been taller) has a counterfactual reading (is evaluated w.r.t fictive worlds), the than-clause in (22) has a "factual" reading - i.e. one in which it is evaluated with respect to the "actual world". If the ACTUALLY operator is assumed for this case, then it is also available for *de re* readings in belief-contexts, destroying the motivation for assuming scoping-out in the latter.

It is not clear to me that a scope-based solution is in principle excluded for (22), with DegP, containing more + than-clause, taking scope over the implication (if). But I do not plan to discuss the syntax / semantics of counterfactuals here.

Instead, arguments for a scope-based solution will be given using binding and ACD facts, which must be accounted for structurally. These facts cannot be accounted for by double-indexing. Moreover they require scoping for examples which only have *de re* readings. The weakest conclusion is that scoping can be responsible for the presence of *de re* readings / absence of *de dicto* readings in belief contexts (even if *de re* readings can also arise without scoping). The stronger conclusion that all *de re* readings arise from scoping would require examination of Stechow's argument from counterfactuals.

### 2.3 *De re* at S-structure

Now consider assumptions about the S-structure(s) for the LFs (18):

(18) a. $[_{IP2}$ John said $[_{IP1}$ Mary left at time t ] & $[_{PP}$ t < t', t' s.t. Mary left at time t' ] ]
= *de re*

b. $[_{IP2}$ John said $[_{IP1}$ Mary left at time t & $[_{PP}$ t < t', t' s.t. Mary left at time t' ] ] ]
= *de dicto*

In each case, we would want to say that the PP is inside $IP_1$ at S-structure:

(23) $[_{IP2}$ John said $[_{IP1}$ Mary$_j$ left $[_{PP}$ before she$_j$ did (leave) ] ] ]

The reasons are the following:

(i) temporal adjuncts are generated in the clause whose verb they temporally modify
(ii) word order facts show that the temporal adjunct in (18a,b) is inside $IP_1$ at S-structure

(ii) is a standard (and natural) assumption about the "base position" of adjuncts such as the before-PPs. Consider the meaning of temporal before. It relates two time points, t and t', and sets them in the temporal "before" relation (t < t'). One time point (t) is identified with the event time of a verb outside the PP, the other (t') is identified with the event time of a verb inside the PP (i.e. inside the clause governed by *before*) (see Thompson 1995 for discussion). So in (24), t = the event time of Mary's eating, t' the event time of Mary's leaving. The PP 'modifies' t, the event time of ate.

(24) a. Mary ate before she left.
b. eat(m,t) & t<t' & leave (m,t')

The word order facts indicating that PP in both (18a) and (18b) is inside $IP_1$ at S-structure relate to the Right Roof constraint. Under the reading in which PP modifies left, PP may not be separated from $IP_1$ by material belongng to $IP_2$ but not $IP_1$:

(25) a. He will say (when you meet him) tomorrow that Mary left before she actually did.
b. * He will say that Mary left (when you meet him) tomorrow before she actually did
c. He will say that Mary left before she actually did when you meet him tomorrow

i.e. a postverbal temporal adjunct is never ordered discontinuously w.r.t other constituents of the clause headed by the verb it modifies.

### 2.4 *De re* as LQR

Given these assumptions about S-structure, the conclusion that the adjunct can undergo LQR is straightforward. If the PP is in IP2 at S-structure, then it must undergo movement between S-structure and LF, for the LF (18a) to be derived. That movement is motivated by scope facts (interpretation of LF), i.e. is a candidate for "QR". QR extracts PP out of a finite complement, so it is LQR.

Similarly for the comparative example. Assuming that the than-clause is the complement of Deg°, the *than*-clause must be generated in the embedded IP in (20), even for the LF (20b). Right-roof effects support the claim that the than-clause in (20b) is inside IP2 at S-structure, even if extraposed from DegP: [10]

(26) a. She will say (when you meet her) tomorrow that John is taller than he actually is.
b. * She will say that John is taller (when you meet her) tomorrow than he actually is
c. She will say that John is taller than he actually is when you meet her tomorrow

Hence, the mapping from S-S to the LF (20b) must involve raising of DegP out of the finite complement into the higher clause.

This conclusion ties in neatly with the fact that comparative than-clauses can contain wide scope ACD's:

(27) a. John thinks that Mary is taller than Bill does
b. John thinks that Mary is taller than Bill does *think that Mary is*

The reading (27b) can be accounted for, assuming an LQR analysis as outlined in §1.1. Following reconstruction of the *than*-clause (if extraposed) into DegP, LQR raises DegP to give (28b). The VPE in the *than*-clause is no longer contained in the matrix VP and may take this as its antecedent (28c):

(28) a. $[_{IP1}$ John thinks that $[_{IP2}$ Mary is $[_{DegP}$ more than Bill does _ ] d-tall ] ]

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[10] Chomsky (1981:82ff) discusses examples where right roof seems not to contrain the relation between more and than X. The case at hand does not fall under that type.

b. [$_{DegP}$ more than Bill does _ ] [$_{IP1}$ John thinks that [$_{IP2}$ Mary is $t_{DegP}$ d-tall ] ] ]

c. [$_{DegP}$ more than Bill does *[$_{VP}$ thinks that Mary is $t_{DegP}$ d-tall ]* ]
[$_{IP1}$ John **[$_{VP}$ thinks that Mary is $t_{DegP}$ d-tall** ] ]

Crucially, ACDs like these require a structural solution. The VPE must be raised out of the VP of the matrix clause, to be intepretable at all i.e. to avoid the "regress problem". Notice further that (27) has only a *de re* reading for DegP - it is not paraphrased by (29a), but by (29b):

(29) a. What John thinks is that the degree to which Mary is tall exceeds the degree to which Bill thinks that Mary is tall.
b. The degree to which John thinks that Mary is tall exceeds the degree to which Bill thinks that Mary is tall.

Hence, ACDs dictate (i) that DegP can scope out of believe-complements (to avoid antecedent-containment); (ii) when it does, it receives a *de re* reading. Hence, it seems reasonable that scoping of DegP (rather than "double-indexing") is also responsible for *de re* readings in Russell-sentences (17b).

## 3. Restrictions on *de re* readings

*De re* readings are found with other verbs than believe-think-say:

(30) a. You shouldn't tell him that Mary$_j$ is taller than she$_j$ is
b. You shouldn't tell him that Mary$_j$ left before she$_j$ did (leave)
c. You've convinced him that Mary$_j$ is taller than she$_j$ is
d. You've convinced him that Mary$_j$ left before she$_j$ did (leave)

But their distribution is restricted. In this section, some restrictions are discussed which would be unexpected in an 'in situ interpretation' approach. These restrictions turn out to provide interesting support for the movement approach.

### 3.1 Island effects

Embedded in factive complements, the constructions under discussion only have an absurd reading:

(31) a. # John regrets that Mary$_j$ left before she$_j$ (actually) did (leave)
b. # The fact that Mary$_j$ left before she$_j$ did (leave) surprised us

It is possible to regard these as island effects: the factive complement is a 'barrier' for LQR (as it is for most cases of A'-movement). [11] Assuming a factive complement is a barrier for LQR would correlate with the fact that wide scope ACDs are impossible e.g. in the complement of regret. If LQR is impossible, the VPE in (32a) cannot escape the antecedent-containment ('regress') trap. In the 'undeleted' (32b), by contrast, relativization across the factive complement yields only a weak island effect.

(32) a. * John regrets that we invited the same people that Mary does
b. ? John regrets that we invited the same people that Mary regrets that we invited.

Alternatively, the absurd readings of (31) may be a purely interpretative effect of the factivity of the construction. The content of the complement is "presupposed" in the "actual world", so that a *de re* reading of the adjunct leads to the same conflict as found with I left before I did. For the LQR account of *de re* readings, this account of (31) seems to be neutral as to whether LQR may apply in these examples or not.

There seems to me to be a potentially sensible reading for (31a) which the example does not have. This can be paraphrased as (33a). The corresponding paraphrase of (33b) seems less acceptable:

(33) a. John regrets that Mary left at noon, noon being earlier than when she actually did leave.
b. # The fact that Mary left at noon surprised us, noon being earlier than when she actually did leave.

The contrast between (33a,b) and between (33a) and (31a) might argue against a semantic approach to the latter. As a speaker, I am not responsible for the presupposition when I report John's regret, but I am responsible for the presupposition when I present something as a fact (33b). While I can't dissociate myself from the presupposition of what I present as a fact by using actually in (33b), I can dissociate myself from the presupposition of what I report about John's regret by using actually in (33a). Why can't I do this by using actually in (31a)?

Whatever underlies (31), factive complements can be used as a further tool in investigating the properties of *de re / de dicto* readings and their relation with facts from other domains.

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[11] Fn: De re readings are also unavailable in wh-island and adjunct islands:
(i) John asked who$_j$ left before he did$_j$
(ii) John thought [that Mary would be late because she$_j$ left before he did$_j$ ]
The *de re* reading reported for comparatives in counterfactual conditionals (cf. sect. 2.) raises a question about LQR and the barrierhood of if-clause which I do not go into here.

### 3.2 Topic Freezing Effect

A before-adjunct can stand in pre-subject position in the clause containing the verb it modifies (34). However, the *de re* readings is not available for a before-adjunct in pre-subject position. The effect is sharp - cf. (35):

(34) a. Before she left, Mary ate.
b. John said that before she left, Mary ate.

(35) # John said that before she$_j$ (actually) did (leave), Mary$_j$ left.

It is not easy to envisage a purely semantic-interpretive account of this restriction. In the approach sketched by Stechow (cf. §2.), it would probably have to be stated in terms of a restriction on the distribution of the ACTUALLY operator.

The movement approach opens an interesting perspective on the restriction. It is plausible to suppose that a pre-verbal before-clause has undergone leftward A'-movement already in overt syntax (maybe topicalization). There is a well-known restriction to the effect that a phrase that undergoes A'-movement in overt syntax may not undergo further movement in the LF-component. This restriction is claimed to underly the impossiblity to topicalize wh-phrases in English (36a) or to scramble wh-phrases in German (36b) in multiple questions (Lasnik & Saito 1992, Epstein 1992, Müller & Sternefeld 1993):

(36) a. * Who said that who$_j$ , John saw t$_j$ ?
b. * Wer$_j$ sagte, daß wen$_j$ Hans t$_j$ gesehen hat?
who said that whom John seen has
c. # John said [ that [$_{PP}$ before she$_j$ did (leave)] , Mary$_j$ left t$_{PP}$ ]

Assuming an analysis of wh-in-situ in terms of LF-movement, (36a,b) are bad since the moved wh-phrase is unable to move on to its target position (Spec,CP in the matrix) in the covert component. Analogously, the temporal clause in (36c), having preposed in overt syntax, would be prohibited from undergoing LQR at LF, so that only the absurd interpretation is available.

Similar facts are found with preposed comparatives (DegP): (37) is fine, while (38) only has absurd readings: [12]

(37) John said that taller than Mary is, (only) John is.

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[12] Wide scope ACDs are impossible if DegP is preposed, but this has an account in terms of a PF-condition independent of the licensing of LQR - cf. Wilder (1995):
(i) * John said that taller than Bill did, only Mary is.

(38) a. # John said that taller than she$_j$ is, (only) Mary$_j$ is.
b. # John said that taller than Mary$_j$ really is, (only) she$_j$ is.

### 3.3 Parentheticals

Uttered in a neutral context, a simple declarative root clause like (39a,b) is taken to report a belief of the speaker. (39b) is felt to be anomalous, since it attributes a contradictory belief to the speaker:

(39) a. Mary left before Bill did.
b. # Mary$_j$ left before she$_j$ did.

The insertion of a parenthetical into a root clause can change the status of that clause in the utterance. In (40a), the root clause reports (the speaker's belief about) a belief of John's. In this sense, the root is interpreted as if it were the complement of the verb in the parenthetical, i.e. (40a) is similar to (40b):

(40) a. Mary left, John thinks, before Bill did.
b. John thinks that Mary left before Bill did.

However, this similarity has its limits, as (41) shows. The temporal adjunct in (41a) cannot be interpreted *de re* with respect to the parenthetical verb:

(41) a. # Mary$_j$ left, John thinks, before she$_j$ actually did leave.
b. John thinks that Mary$_j$ left before she$_j$ did.

This paradigm is predicted by the movement analysis. In (41a) there is no higher VP for PP to adjoin to, hence no *de re* reading, although the root is interpreted as subordinate to an opaque predicate. If "direct interpretation in situ" were available as a means of deriving *de re* readings, it would be unclear why the *de re* reading is unavailable in (41a).

The paradigm can be reproduced with comparatives:

(42) a. # Mary$_j$ is taller than she$_j$ is.
b. # Mary$_j$ is taller, John thinks, than she$_j$ actually is.
c. John thinks that Mary$_j$ is taller than she$_j$ is.

The behaviour of temporal adjuncts and comparative clauses contrasts with the concessive adverbial in (43):

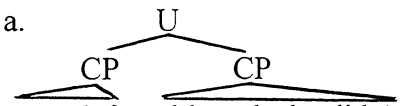
(43) a. # Mary$_j$ left, although she$_j$ didn't.

b. Mary$_j$ left, John thinks, although she$_j$ didn't.

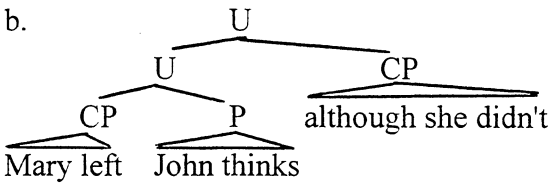
While (43a) is contradictory, the insertion of the parenthetical permits the although-clause to be evaluated with respect to a different world (i.e. the 'actual' world) than the matrix, which can be evaluated with respect to the belief-world of John.

Why the contrast? Unlike the temporal PP in (41) or the comparative clause in (42), the concessive clause does not need to be generated within the matrix clause. Suppose that a parenthetical is generated outside the root main clause (ignoring the problem of serialization), and attaches to it to form a unit U (= 'utterance'). The although-clause in (93) can be directly attached to the unit that results from combining the parenthetical with the root, schematically as in (44b) (P = 'parenthetical'):

(44) a.




b.




In both (44a&b), the concessive clause is interpreted w.r.t the speaker's belief world. In (44a), so also is the matrix, hence the absurdity. [13] In (44b), the matrix is interpreted with respect to the belief-world of John, introduced by the parenthetical, hence the contradiction is lifted. We make the usual assumption that root clauses are 'islands', out of which nothing can be displaced by move-α. Neither the temporal (41a) nor the comparative (42b) can reach the position of the *although*-clause in (44b) by LF, since both must, to be licensed at all, be generated inside the root clause, where they then are trapped.

## 4. Binding: QR voids Condition C effects

The claim that the adjunct is outside the complement clause at LF when it receives a *de re* reading, is corroborated by binding facts. Covert movement alters c-command relations that obtain at S-structure. Assuming that the Binding Theory applies to LF-representations, we expect mismatches between S-structure c-command and binding possibilities in exactly those cases where covert phrasal movement applies.

The paradigm (45) can explained in terms of QR 'bleeding' Binding Condition C - a c-command relation that holds at S-structure no longer holds at LF, after QR has applied (Fiengo & May 1994:265-6):

(45) a. * She told him$_j$ that John$_j$ must leave

---

[13] Although is similar to the coordinator and, in requiring the truth of both the host clause and its own complement clause. (44a) is contradictory in the same way as is *Mary left and she didn't*

b. She gave him$_j$ whatever John$_j$ asked for

c. [ whatever John$_j$ asked for *t* ]$_{NP}$ [ she gave him$_j$ $t_{NP}$ ]

d. She gave him$_j$ whatever John$_j$ wanted her to _

e. [ whatever John$_j$ wanted her to *give him*$_j$ $t_{NP}$ ]$_{NP}$ she [ gave him$_j$ $t_{NP}$ ]

(45a) violates Condition C at LF: the name in the complement clause of told is c-commanded by the indirect object pronoun at SS and, assuming QR does not affect complement clauses, at LF. That the name in the free relative in (45b) need not be obviative w.r.t. the pronoun is explained if the relative undergoes QR (45c). The neutralization of Condition C by QR goes hand in hand with the licensing of ACDs (45d-e). [14]

Consider now temporal adjuncts. In a main clause (46), a name inside a postverbal adjunct must be obviative with respect to the main clause subject - a Binding Condition C effect. This indicates the adjunct is in the domain of the subject: [15]

(46) * She$_j$ ate before Mary$_j$ left

When the adjunct modifies an embedded verb and receive a de dicto reading, the Condition Effect remains. The de dicto reading is forced in the complement of fact/regret (cf. sect. 3.1). This was explained in terms of the barrierhood of factive CP for A'-movement (LQR):

(47) a. * John regrets that she$_j$ ate before Mary$_j$ left

---

[14] In ACD-examples, reconstruction of ellipsis sites appears to **feed** BC.C. C-command relations not apparent at S-structure can be created after QR by reconstruction of the VPE (copying of the antecedent). In (i), he may not corefer with John, although the pronoun apparently does not c-command the name; in (ii), the effect is missing. The cases are correctly distinguished at LF -- copying in the antecedent VP *introduce John to t* after QR yields a configuration in the relative in which the pronoun c-commands a name in the first case but not in the second:

(i) * She introduced John$_j$ to everyone that he$_j$ did _

(ii) She introduced John$_j$ to everyone that his$_j$ mother did _

(iii) [ everyone that { his$_j$ mother / *he$_j$ } did *introduce John$_j$ to t* ] she introduced John$_j$ to t

However, wide scope ACD does not feed BC.C in this way - the pronoun in (iv) may corefer with the name (example requires *she* and *he* to be stressed):

(iv) She said that everyone met John$_j$ that he$_j$ did _

Copying the antecedent VP *say that t met John* into the VPE after QR should yield a Condition C violation (v). The fact that it doesn't is analysed by Fiengo & May (1994:ch.5) in terms of "vehicle change" - a name may be replaced by its 'pronominal correlate' under reconstruction. Hence, (iv) has (vi) as a possible output:

(v) [ everyone that he$_j$ did *say that _ met John$_j$* ] she said that _ met John$_j$ **BC.C*

(vi) [ everyone that he$_j$ did *say that _ met him$_j$* ] she said that _ met John$_j$ *vehicle-change.*

Why doesn't vehicle change make (i) grammatical? In this case, turning the name into a pronoun turns the violation of Condition C into a violation of Condition B (vii):

(vii) *[ everyone that he$_j$ did *introduce him$_j$ to t* ] she introduced John$_j$ to t **BC.B*

The existence of vehicle-change effects under ellipsis masks the effects of the binding conditions in wide-scope ACDs. Hence the parallel between wide scope ACDs and *de re* readings does not show through in the data. Section 6. discusses pronominal variable binding in wide-scope ACDs.

[15] This Condition C effect is neutralized if the adjunct is preposed: *Before Mary$_j$ left, she$_j$ ate.*

b. * The fact that she$_j$ ate before Mary$_j$ left surprised us.

c. John regrets [$_{CP}$ that she left PP ]

<-----x----------

The *de re* reading become possible when the construction is complement to believe or think, and then the condition C effect is vitiated (such examples may not be perfect, but the relevant constrasts are clear):

(48) ? John thinks that she$_j$ ate before Mary$_j$ left. (ok if PP = *de re*)

The *de re* reading is most accessible in examples of the type discussed in sect. 2, with absurd de dicto readings:

(49) a. ? John thinks she$_j$ left before Mary$_j$ did (leave).

b. ? John thinks she$_j$ is taller than Mary$_j$ (actually) is.

The correlation between the availability of a *de re* reading and the lifting of the Condition C effect strengthens the proposal in sect. 2, that *de re* / de dicto contrasts for temporal adjuncts are reflected structurally in LF-representations. If Condition C holds at LF, the name contained in the temporal adjunct in (48/49) must not be in the c-command domain of the subject at that level. Conversely, the name contained in the adjunct must be in the c-command domain of the subject in the LF of (47). The proposal that *de re* readings are the result LQR, and factive CPs are barriers for LQR, is supported by Binding effects. LQR gives rise to *de re* readings, and simultaneously bleeds BC.C.

The LQR analysis makes further predictions. Inside a factive complement, *de re* / *de dicto* ambiguities should be possible, and *de re* readings should correlate with the neutralization of condition C effects. But this neutralization will only be relative to NPs below the landing site of LQR. Consider the paradigm (50-51):

(50) a. John regrets that Bill thinks she$_j$ is taller than Mary$_j$ (actually) is.

b. John regrets that Bill thinks she$_j$ left before Mary$_j$ did (leave).

c. Bill regrets [$_{CP}$ that John thinks [$_{CP}$ that she left PP ]]

<----ok----------

(51) a. * John regrets that she$_j$ thinks she is taller than Mary$_j$ (actually) is.

c. * John regrets that she$_j$ thinks she left before Mary$_j$ did (leave).

These facts can be described as follows. The adjunct PP (or the DegP) can raise out of the complement of thinks. Hence a name inside the adjunct/than-clause can escape the

c-command domain of the subject of the complement of thinks at LF. Coreference induces no Condition C effect (50). But the raised PP/DegP cannot leave the factive complement. Assuming that its landing site inside the factive complement is in the c-command domain of the subject of the factive complement, a name inside it may not corefer with that subject (51). This is corroborated by simple root clauses:

(52) a. * She$_j$ thinks she$_j$ left before Mary$_j$ did (leave).
b. * She$_j$ thinks she$_j$ is taller than Mary$_j$ (actually) is.

## 5. Locality

The facts in sect. 4 raise the question of what the landing site of LQR is. Insofar as the neutralization of the condition C effect in *de re* readings reflects the height of the temporal adjunct in the tree, condition C effects can be used to specify more narrowly the position of the adjunct in the tree following LQR. The evidence converges on the following proposal:

(53) a. long QR adjoins XP to VP immediately dominating $CP_{fin}$

b. long QR may cross at most one finite CP

... [$_{VP}$ V [$_{CPfin}$ ... [$_{VP}$ V [$_{CPfin}$ ... t ... ] ...] ...] ... ] ...

### 5.1 More Condition C effects

If (53) is correct, then LQR adjoins XP to the VP immediately dominating the finite CP complement. It then has scope over the matrix predicate. Assuming that all other arguments of the higher verb are outside VP at LF, then we expect QR to bleed BC.C only with respect to arguments of the clause from which XP originates. The facts support this view.

(52) has already shown that a name in an embedded adjunct cannot escape the c-command domain of the subject of the next clause up, when that clause is the root. (54) reproduces that fact for an embedded higher clause:

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16 The assumption that VP, and not a higher functional projection, forms the landing site of QR, is made for simplicity of exposition. The intended result is that LQR cannot raise a constituent of a finite complement above a satellite of the higher VP-IP projection. Also necessary therefore is the assumption that the lower segment of the VP-adjunction site may form the antecedent to the VPE contained in the raised constituent. On the possibility for LQR to raise more than one constituent out of the complement clause, see section 6.

(54) a. * John said that she$_j$ thinks she left before Mary$_j$ (actually) did (leave).
b. * John said that she$_j$ thinks she is taller than Mary$_j$ (actually) is.

(55) shows that a name in embedded adjunct that undergoes LQR also remains in c-command domain of the object of the higher VP (cf. the examples (30), sect. 3.):

(55) a. * You've convinced her$_j$ that she$_j$ left before Mary$_j$ did (leave).
b. * You$_j$ shouldn't tell her$_j$ that she$_j$ is taller than Mary$_j$ (actually) is.

### 5.2 Boundedness of wide scope ACDs

(53) further predicts that wide scope ACDs will show strict boundedness effects. Consider the abstract representation of a comparative wide scope ACD (56), where VP* provides the LF-antecedent to the VPE contained in XP:

(56) a. [$_{VP*}$ ... [$_{CPfin}$ ... [$_{XP}$ more ... than ... [$_{VP}$ e ]] ... ]] *S-structure*

b. [$_{VP*}$ [$_{XP}$ more ... than ... [$_{VP}$ e ]] [$_{VP*}$ ... [$_{CPfin}$ ... $t_{XP}$ ... ]] *LF*

Given (53), we predict that no more than one finite CP-node may intervene between VP* and XP in S-structure. This is because the adjunction of XP to VP* is what will void the antecedent-containment in LF; if more than one finite CP intervenes, the locality constraint on QR would not be met. Notice that (53) permits other nodes, including non-finite VPs or clauses, to intervene between VP* and XP on either side of the finite CP.

The paradigm (57) indicates the effect induced by the boundedness of long QR on wide scope VPE. In each of (57a,b,c), the constituent (more trees...) that undergoes QR is located in the first finite clause dominated by the VP-antecedent to the VPE in the comparative clause. These three examples have the readings indicated in (58):

(57) a. John thinks that more trees died than Mary does _
b. John thinks that more trees seem to have died than Mary does _
c. John thinks that it seems that more trees have died than Mary thinks it does _
d. * John thinks that it seems that more trees died than Mary does _

(58) a. John [thinks [that more trees died than Mary does *think [ that _ died ]* ]]

b. John [thinks [that more trees seem to have died
than Mary does *think* [ *that _ seem to have died* ]]]

c. John thinks that it [seems [that more trees have died
than Mary thinks it does *seem* [ *that _ have died* ] ]]

In (57d), the constituent (more trees...) that undergoes QR is located in the second clause below the VP-antecedent to the VPE in the comparative clause.

(59) a. * John [thinks [that it seems [that more trees died than Mary does
*think [ that it seems [ that _ died ]] ]]]*

b. * [$_{VP}$ *think* [$_{CPfin}$ ... *seem* [$_{CPfin}$ ... t ... ] ...] ]

Consequently, QR would have to cross two finite CP boundaries, to escape antecedent of the VPE. The example is not acceptable, in particular it does not have the reading shown in (59a).

### 5.3 Lack of inverted scope readings

As noted in sect. 1.1, LQR does not lead to scopal interactions between the raised item and a satellite of the higher verb. Thus there is no ∀∃ reading in (60), despite the fact that the relative clause modifiying the embedded subject contains a wide scope VPE. [17]

(60) Someone believes that everyone is a genius that Mary does (ok: ∃∀ / * ∀ ∃ )

We now have the basis of an account for this restriction. The proposal (53), together with the assumption that all satellites of the matrix predicate are outside the matrix VP at LF, permits all the facts discussed in this section to be captured. At LF, the QNP everyone+relative clause in (60) c-commands the matrix predicate (believe), but does not c-command the subject someone. The lack of an inverted scope reading thus correlates with the fact that Condition C effects are not neutralized for Mary in example (52) (repeated here).

(52) a. * She$_j$ thinks she$_j$ left before Mary$_j$ did (leave).
b. * She$_j$ thinks she$_j$ is taller than Mary$_j$ (actually) is.

Just like the QNP in (60), the temporal adjunct in (52) c-commands the predicate of the higher clause, but not the matrix subject, in LF.

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17 Examples like (i) do not have a reading in which the object is in the scope of the embedded subject:
(i) John will convince at least one professor that every student is a genius
Parallel examples with wide scope VPE - indicating that LQR is available - are possible; cf. ex. (30), sect. 3.

## 6. Pronoun-binding by QNPs

Wide scope ACD's indicate that the subject of a finite complement can scope out of the higher VP:

(61) a. John said that everyone is tall that Mary did

b. John ... $[_{VP}\ [_{NP}$ everyone [ that Mary did [say e is tall]]] $[_{VP}$ said [ $t_{NP}$ is tall ]]

c. $\forall x$ (say (M,(tall(x))) $\rightarrow$ (say(J,(tall(x))

The QNP has a *de re* reading w.r.t John said ... . In this case, the *de re* reading is the only possibility (antecedent containment). LQR of the QNP (everyone+relative clause) is what licenses the *de re* reading and the wide scope VPE. In this case, we might view LQR as responding to the 'interpretative needs' of (a subpart of) the QNP itself.

Now consider (62). The comparative has a sensible (*de re*) reading; and the pronoun he in the comparative clause is bound by everyone. Hence the embedded subject can include a *de re* DegP in its scope:

(62) John said [ that everyone$_j$ is taller than he$_j$ (actually) is ]

If the LQR account of the *de re* reading for DegP is correct, then everyone must be assumed to undergo LQR in this case too. Interpreting "in the scope of $\alpha$" as "c-commanded by $\alpha$ in LF", then everyone must c-command the pronoun in the than-clause in LF. If everyone is not raised out of the complement of say (but is, for the sake of argument, adjoined to the lower IP), then the bound variable reading should not be possible:

(63) a. John ... $[_{VP}\ [_{VP}$ [-er than he$_j$ is $]_{DegP}$ $[_{VP}$ said [[everyone]$_j$ [ $t_j$ is $t_{DegP}$ tall ]]
(* by the c-command condition on bound variables)

b. $\exists$d,d':d > d' & (say (J,($\forall$x tall(x,d'))) & (tall(x,d))
(last occurrence of x not bound)

This seems to be correct: the reading of (62) is not captured by (63b). In fact the conclusion (i) that everyone must c-command (the pronoun in) the than-clause in LF (bound variable reading), can be strengthened to (ii) everyone must c-command DegP in LF, as in (64a). The latter is necessary, as everyone must include the comparative operator in its scope: the degrees being compared (the height that each person actually has, and the height that, according to John, each person has) vary for each person considered, as in (64b):

(64) a. John ... $[_{VP}$ [everyone]$_j$ $[_{VP}$ [-er than he$_j$ is $]_{DegP}$ $[_{VP}$ said [ $t_j$ is $t_{DegP}$ tall ]]

b. $\forall x\ \exists d,d':d < d'$ (tall(x,d)) (say (J,(tall(x,d)))

Thus we have evidence (i) that QNPs can undergo LQR from the finite complement subject position independently of the 'interpretative demands' of the QNP itself; and (ii) that more than one constituent can undergo LQR. [18]

(62) involves binding of a pronoun in a DegP that is interpreted *de re*. The analysis of (62) in terms of multiple LQR would be on firmer footing if it could be shown that such pronoun binding can also cooccur with a wide scope ACD. The wide scope VPE would only be licensed by LQR of the DegP containing it. If a QNP in the same clause could independently undergo LQR, then it should be able to bind a pronoun in the DegP. The relevant examples are deviant, though - contrast (65)-(66) with (62) and with (67):

(65) a. ?? Mary thinks [ that everyone$_j$ is taller than he$_j$ does (himself) ]

b. Mary ...
$[_{VP}$ [everyone]$_j$ $[_{VP}$ [-er than he$_j$* does *think he$_j$ is d-tall* $]_{DegP}$
... $[_{VP}$ thinks [ $t_j$ is $t_{DegP}$ tall ]]]]

(66) a. * Mary thinks that everyone$_j$ is taller than his$_j$ mother does

b. Mary ...
$[_{VP}$ [everyone]$_j$ $[_{VP}$ [-er than his$_j$* mother does *say he$_j$ is d-tall* $]_{DegP}$
... $[_{VP}$ thinks [ $t_j$ is $t_{DegP}$ tall ]]]]

(67) a. Mary thinks that everyone is taller than he thinks he is (himself).

b. Mary thinks that everyone is taller than his mother thinks he is.

In the putative LFs (65b) and (66b), everyone, he*/his* and the variable left by LQR of everyone, stand in a weak crossover configuration. However, trying to exclude such examples by appeal to Bijection (or whatever underlies WCO) raises the issue of why the effect is not present in (62) (cf. also note 16). I leave this issue open here.

## 7. Long distance operator movement in temporal adjuncts and VPE

The claim that the *de re* reading of the before-adjunct in (68) results from LQR is supported by binding data like (68b) (cf. sect 4 and sect. 5). But it is not supported by the ACD facts. In

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[18] There is a potential problem with this example. A weak crossover configuration arises in the LF (64a), after LQR, though the example shows no corresponding deviance. This may be a case of the well-known amelioration of WCO-effects for pronouns contained in tensed clauses (*That he$_j$ had to work bothers everyone$_j$*).

the case where the temporal adjunct modifies the embedded verb, the VPE in (68) permits the reading (70a) but not (70b) (cf. sect. 1.3 above):

(68) a. John thinks Mary$_j$ left before she$_j$ did.
b. ? John thinks she$_j$ left before Mary$_j$ (really) did.

(69) John said that Mary arrived before Bill did.

(70) a. John said that [[Mary arrived] before Bill did *arrive*]
b. * John said that [[Mary arrived] before Bill did *say that Mary arrived*]

However, the impossibility of (70b) can be shown to be due to independent factors, so that the paradigm does not endanger the claim that temporal adjuncts can undergo LQR.

The explanation for the impossibility of (70b) runs thus:

(71) a. A wide scope reading of the VPE in the adjunct entails
a "long-distance" dependency inside the adjunct.
b. A long distance dependency in a temporal adjunct is impossible
when the matrix VP is a VPE-site.

That is, two factors conspire to exclude (70b). Let us look at details.

The key notion is that of "long distance" dependency in a temporal adjunct. The meaning of before is t<t', where t = the event time of the external verb, and t' = the event time of a verb inside the adjunct. When before governs a tensed clause, t' may be the event time of a verb in a subordinate clause inside the adjunct (72c). This the "long-distance" reading:

(72) a. John left before Mary said that he would _
b. John left at t & [ t<**t'** & Mary said at **t'** [that John would leave ]] (short-distance)
c. John left at t & [ t<**t'** & Mary said [that John would leave at **t'** ]] (long-distance)

Several authors (e.g. Thompson 1995) propose that the event time of the embedded verb is linked to before (which relates it to the event time of the V modified by the adjunct) via syntactic movement of a "null" temporal operator (perhaps a null when): [19]

(73) a. John left [ before **O$_j$** Mary said **e$_j$** [that he would (*leave*) ]] =(72b)
b. John left [ before **O$_j$** Mary said [that he would (*leave*) **e$_j$** ] ] =(72c)

---

[19] Examples with overt operator are marginally acceptable (for me), with the same ambiguity: *? John left before when Mary said that John would (leave).* This may well be the same construction as (72).

A wide scope VPE in an ACD context entails a long-distance dependency such as (73b) in the before-adjunct. If the VPE in (69) takes the matrix VP (said that IP) as its antecedent, the dependency in the before-adjunct cannot be a "short-distance" one, i.e. the before-adjunct cannot have the reading (74b):

(74) a. John said that [Mary arrived [ before $O_j$ Bill did *say* $e_j$ [ *that Mary arrived*]]]
b. John said that [Mary arrived **at** $\mathbf{t_1}$[ $\mathbf{t_1}$<$\mathbf{t_2}$ Bill did *say* **at** $\mathbf{t_2}$ [ *that Mary arrived*]]]

The reason is presumably the following: at LF, the before-adjunct must raise out of the matrix VP headed by said, so that the VPE in the adjunct can take that matrix VP as antecedent (=containment avoidance). This is LQR. Suppose LQR of the temporal adjunct leaves an A'-bound trace, i.e. a 'temporal variable' ($e_k$):

(75) [ before $O_j$ Bill did *say* $e_j$ [ *that Mary arrived*]]$_k$ John said that [Mary arrived $\mathbf{e_k}$ ]

The VPE in the adjunct is not identical with the matrix VP, since the former contains a temporal variable in its matrix clause ($e_j$) the latter contains one in its lower clause ($e_k$). Hence, the relation of the VPE to its antecedent is not licensed at LF. [20] The only option that satisfies the identity requirement for the VPE / antecedent-VP relation is one in which the adjunct itself contains a long-distance dependency, as in (76), with the reading (76c):

(76) a. John said that [Mary arrived [ before $O_j$ Bill did *say* [ *that Mary arrived* $e_j$ ]]]
b. [before $O_j$ Bill did *say* [*that Mary arrived* $e_j$ ]]$_k$ John said that [Mary arrived $e_k$ ] (=LQR)
c. John said that [Mary would arrive **at** $\mathbf{t_1}$] $\mathbf{t_1}$<$\mathbf{t_2}$ Bill did *say* [ *that Mary would arrive* **at** $\mathbf{t_2}$ ]]]

The upshot is that (71a) holds. The wide scope VPE reading for (69) requires a long-distance dependency in the before-clause.

Consider now (71b): a long distance dependency in a temporal adjunct is impossible when the matrix VP is a VPE-site. This is illustrated in the following paradigms. The before-clause (77a) with matrix VPE, has short-distance readings (78) but no long-distance reading (79a). The long-distance reading is possible with embedded VPE (77b) - cf. (79b):

(77) a. Mary said that we left at 2. This was before John did.
b. Mary said that we left at 2. This was before John said we did.

[20] In the copy-theory of VPE, copying the antecedent VP would automatically transfer the variable in the lower clause to the VPE-site, hence the short-distance reading of the adjunct could not arise.

(78) a. This was before [ $O_j$ John did (*leave* $t_j$) ]
b. This was before [ $O_j$ John did $t_j$ (*say that we left* (*at 2*)) ]

(69) a. * This was before [ $O_j$ John did (*say that we left* $t_j$) ]
b. This was before [ $O_j$ John said that we did (*leave* $t_j$) ]

The same effect is shown in (80-81):

(80) a. 2 o'clock was when John said that we left. This was before Mary did.
b. 2 o'clock was when John said that we left. This was before Mary said that we did.

(81) 2 o'clock was [ $when_j$ John said [ that we left $t_j$ ]] ...
a. This was before [ $O_j$ Mary did (*leave* $t_j$) ]
b. * This was before [ $O_j$ Mary did (*say that we left* $t_j$) ]
c. This was before [ $O_j$ Mary said that we did (*leave* $t_j$) ]

The contrast between temporal adjuncts (no wide scope ACDs) on the one hand, and comparatives etc. (permit wide scope ACDs) on the other, relates not to a difference in LQR, but to a difference concerning the effect of ellipsis on long-distance dependencies. A long-distance dependency headed by a relative operator in an ACD is not blocked by matrix VPE:

(82) a. John thinks that everyone is clever that Bill does
b. everyone ... [ $Op_j$ that Bill does *think [ (that)* $t_j$ *is clever]]*

Otherwise, of course, wide scope ACDs could not exist. And the same goes for long-distance dependencies in relatives that are not in ACDs - these also permit matrix VPE:

(83) a. I am the person that John said that the book was for t, and
she is the person that Bill did

b. ... she is the person [ $Op_j$ that Bill did *say* [ *that the book was for* $t_j$ ]]

While I have no explanation for (71b), it is supported by data independent of ACDs. In effect, (71b) conspires with (71a) to exclude the wide scope ACD (70b).

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