

Two Reconstruction Puzzles

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Some constructions exhibit what is known as “reconstruction effects”.

- (1) Some student seems to be in the building.

Here I discuss two cases which, I think, have the following in common: they have been misanalyzed as reconstruction effects.

1. CASE I – Superlative relative clauses

I argue, contra Bhatt 2002, that a superlative morpheme that “heads” a relative clause is external to the relative clause.

1.1 The problem

Bhatt observes that (2) is ambiguous in the way indicated below:

- (2) The longest book John said Tolstoy had written was War and Peace.

- a. High reading (longest >> say):

John said: “Tolstoy wrote War and Peace, Anna Karenina, and Tom Sawyer.”

Of these, War and Peace is the longest.

- b. Low reading (say >> longest):

John said: “Tolstoy wrote War and Peace, which is 2000 pages long; Crime and Punishment, which is 1500 pages long; and Tom Sawyer, which is 1000 pages long.”

Bhatt further observes that adding an NPI to the construction in (2) disambiguates it:

- (3) The longest book John ever said Tolstoy had written was War and Peace (longest >> say)
The longest book John said Tolstoy had ever written was War and Peace (say >> longest)

Obtaining the high reading of (2) is straightforward. We simply have to assume that the superlative morpheme picks out the longest item out of the set {x:x is a book and John said Tolstoy wrote x} (= {War and Peace, Anna Karenina, Tom Sawyer}). Obtaining the low reading is not so straightforward. What we want, is a structure from which we can infer that John said something like: “War and Peace is the longest book that Tolstoy wrote”. The surface structure of (2) is not like that.

Based on the NPI examples in (3), Bhatt argues that the low reading of (2) is obtained from an LF in which **longest book** has a copy in a position below **say**. The high reading is obtained from an LF where **longest book** appears above **say**.

1.2 Background to the “lower copy” analysis

There is compelling evidence that some relative clauses are internally headed.

Amount relatives (Carlson 1977, Heim 1987, Grosu and Landman 1998):

- (4) a. The very few books that there were on his shelves were all mysteries.
 b. There were very few books on his shelves.
 c. *There were the books on his shelves.

Relatives with intensional predicates:

- (5) We are expecting a student tonight. The student we are expecting tonight will probably leave early.

These facts argue for optional reconstruction of the “head”, either syntactically or semantically. Bhatt argues that relative clauses such as (2) exhibit such optional reconstruction. The “low” reading of (2) is obtained by syntactically reconstructing the superlative-Adj-N “head”:

- (6) The est-Adj-N $V_{\text{intensional}}$ [... est-Adj-N...]

1.3 An analysis with a lower superlative copy: Hulsey and Sauerland 2003

The superlative morpheme takes three arguments: a set of individuals (C), a relation between individuals and degrees (R), and an individual (y). C is a pronominal restrictor whose value is determined by the context.

- (7) $[[\text{est}^{\text{relation}}]] = \lambda C \in D_{\langle e, t \rangle} . \lambda R \in D_{\langle e, \langle d, t \rangle \rangle} . \lambda y \in C:$
 $y \in C$ and for all x in C , there is a degree d such that $R(x)(d)=1$.
 there is a degree d such that $R(y)(d)=1$ and for all z in C such that $z \neq y$, $R(z)(d)=0$.
 (Heim 1999)

This semantics is designed to capture the absolute/comparative ambiguity (Ross 1964, Szabolcsi 1986) of sentences with superlative expressions.

- (8) Tolstoy wrote the longest book.

LF: Tolstoy wrote the $\text{est}^{\text{relation}}$ -C long book

Tolstoy wrote the unique x such that x is in $[[C]]^{\text{e}}$ and there is a degree d such that x is d -long and no other y in $[[C]]^{\text{e}}$ is d -long

“Absolute” reading

$C1 = \{x: \text{there is a degree } d \text{ such that } x \text{ is a } d\text{-long book}\}$

Implication: Of the set of salient books, the longest is by Tolstoy.

“Comparative” reading

$C2 = \{x: \text{there is a degree } d \text{ and a } y \text{ such that } y \text{ wrote a } d\text{-long book } x\}$

Implication: Tolstoy is the best book-writer, in terms of length.

The “high” reading of (2) is derived as follows:

(9) **the est^{relation}-C [long-book John said Tolstoy had written] is W-P**

(10) $\llbracket \text{long-book John said Tolstoy had written} \rrbracket = \lambda x \in D_e . \lambda d \in D_d . x \text{ is a } d\text{-long book such that John said Tolstoy wrote } x.$

(11) When defined, $\llbracket \text{the est}^{\text{relation}}\text{-C [long-book John said Tolstoy had written] is W-P} \rrbracket^{\text{g}} = 1$ iff War and Peace is the unique x such that there is a degree d such that x is a d -long book that John said Tolstoy wrote, and no other relevant y is a d -long book that John said Tolstoy wrote.

The low reading of (2) is derived from an LF where **longest book** has a copy downstairs. The copy of **longest book** is a copy in the sense of Fox 2002:

(12) **[the 1 John said Tolstoy wrote the est^{relation}-C long book-1] was W-P**

Interpretation: “War and Peace is the unique x such that John said that Tolstoy wrote x and x is the unique y in $\llbracket C \rrbracket^{\text{g}}$ such that there is a degree d such that y is a d -long book and no other book in $\llbracket C \rrbracket^{\text{g}}$ is d -long”.

Let us go over some possible values for **C**, and the implications they give rise to:

$C1 = \{x: \text{there is a degree } d \text{ such that } x \text{ is a } d\text{-long book}\}$

Implication: John said about x that Tolstoy wrote x , and x is the longest salient book (that was either written by someone, or created by magic).

$C2 = \{x: \text{there is a degree } d \text{ and a } y \text{ such that } x \text{ is a } d\text{-long book that } y \text{ wrote}\}$

Implication: John said about x that Tolstoy wrote x , and x is the longest book written by some author.

$C3 = \{x: \text{there is a degree } d \text{ such that } x \text{ is a } d\text{-long book that Tolstoy wrote}\}$

Implication: John said about x that Tolstoy wrote x and x is the longest book out of the set of books written by Tolstoy.

Problems: If the low reading of (2) corresponds to any of these, it corresponds to the reading arising from C3 (and even that reading is a bit odd). Crucially, there is no way to block C1 or C2.

1.4 Bhatt's proposal: a lower copy with focus

Bhatt assumes that the superlative morpheme is a focus-sensitive operator that takes two arguments: a property of degrees (P), and a property of such properties (C). The latter is a pronominal restrictor whose value is determined via association with Focus (in the style of Rooth 1992). This semantics for **est** was designed by Heim 1995 to capture the comparative reading of superlatives:

- (13) $\llbracket \text{est}^{\text{property}} \rrbracket^{\text{F}} = \lambda C \in D_{\langle \langle d, t \rangle, t \rangle} . \lambda P \in D_{\langle d, t \rangle} :$
 for all $P' \in C$, there is a degree d such that $P'(d)=1$.
 there is a degree d such that $P(d)=1$ and for all Q such that $C(Q)=1$ and $Q \neq P$, $Q(d)=0$.

- (14) TOLSTOY wrote the longest book.
 LF: $\text{est}^{\text{property}}\text{-C} \llbracket \llbracket 1 \llbracket \text{Tolstoy}_F \text{ wrote the } d_1\text{-long book} \rrbracket \rrbracket \sim C$

$\llbracket C \rrbracket^{\text{F}} \subseteq \{ \{d: \text{Tolstoy wrote a/the } d\text{-long book} \}, \{d: \text{Dostoevsky wrote a/the } d\text{-long book} \}, \{d: \text{Shakespeare wrote a/the } d\text{-long book} \}, \dots \}$

- (15) When defined, $\llbracket \text{est}^{\text{property}}\text{-C} \llbracket \llbracket 1 \llbracket \text{Tolstoy}_F \text{ wrote (the) } d_1\text{-long book} \rrbracket \rrbracket \rrbracket^{\text{F}} = 1$ iff there is a degree d such that Tolstoy wrote a d -long book, and for every other relevant author y , y didn't write a d -long book.

Similarly, the low reading of (2) is derived by having a copy of **longest book** below **say**, and moving **est** to a position above **Tolstoy** but below **say**. The copy of **longest book** is assumed to be a copy in the sense of Fox 2002, and itself contains a variable. This variable is focused:

- (16) $\llbracket \text{the } 2 \text{ John said } \text{est}^{\text{property}}\text{-C} \llbracket \llbracket 1 \llbracket \text{Tolstoy wrote (the) } d_1\text{-long book-}[2]_F \rrbracket \rrbracket \rrbracket \sim C$ was **W-P**

- (17) $\llbracket C \rrbracket^{\text{F}} \subseteq \{ \{d: \text{Tolstoy wrote the } d\text{-long book } a \}, \{d: \text{Tolstoy wrote the } d\text{-long book } b \}, \{d: \text{Tolstoy wrote the } d\text{-long book } c \}, \dots \}$

Resulting interpretation: "War and Peace is the unique x such that John said that there is a degree d such that Tolstoy wrote the d -long book x , and such that no other book written by Tolstoy is d -long".

This interpretation is indeed the one we are after, but it crucially relies on the assumption that traces/copies can be focused. Two problems come to mind. First, the following relative clause doesn't have the reading we would expect it to have if traces/copies could be focused (cf. Beaver and Clark):

- (18) The man who only saw Mary.
 Existing reading: “the man who saw Mary and didn’t do anything else related to her”.
 Non-existing reading: “the man such that only he saw Mary”

Secondly, we expect (2) to have a reading corresponding to (14), but it doesn’t:

- (19) The longest book John said TOLSTOY wrote was War and Peace
[the 2 John said est^{property}-C [[1 [Tolstoy_F wrote (the) d₁-long book-2]]~C] was W-P
 $[[C]]^{\#} \subseteq \{ \{d: \text{Tolstoy wrote the } d\text{-long book } a\}, \{d: \text{Dostoevsky wrote the } d\text{-long book } a\}, \{d: \text{Shakespeare wrote the } d\text{-long book } a\}, \dots \}$

“War and Peace is the unique x such that John said that there is a degree d such that Tolstoy wrote a d-long book x, and no other author y wrote a d-long book x.”

The sentence does have the following reading:

“War and Peace is the longest book John said Tolstoy wrote, and not the longest book John said some other author wrote.”

1.5 My proposal – the superlative morpheme itself is external to the relative clause

The “low” reading of (2):

- (20) **the est^{relation}-C 2 1 [John said Tolstoy had written (the) d₂-long book-1] was W-P**

- (21) War and Peace is the unique x in $[[C]]^{\#}$ such that there is a degree d such that John said Tolstoy had written a d-long book x and no other y in $[[C]]^{\#}$ is such that John said Tolstoy had written a d-long book y.

This is not equivalent to Bhatt’s prediction. We predict, in fact, that John could have given the minimum lengths of the books.

Question: is (2) acceptable in such a scenario? If the answer is Yes, then the reading according to which John is sure that War and Peace is the longest book has to be the result of a pragmatic inference.

We still don’t get Bhatt’s prediction. John could have said: “W-P is the longest book Tolstoy wrote”, without committing himself to a particular length. We need to intensionalize **est**.

- (22) $[[\text{est}^{\text{rel}}]] = \lambda K \in D_{\langle s, \langle s, t \rangle \rangle} . \lambda w \in D_{\langle s \rangle} . \lambda C \in D_{\langle s, \langle e, t \rangle \rangle} . \lambda R \in D_{\langle s, \langle e, \langle d, t \rangle \rangle \rangle} . \lambda y \in D_{\langle e \rangle} :$
 for all $w' \in K(w)$: (i) $y \in C(w')$, and (ii) there is a function $g \in D_{\langle s, d \rangle}$ such that for all x in $C(w')$, $R(w)(x)(g)=1$.
 there is a function $f \in D_{\langle s, d \rangle}$ such that $R(w)(y)(f)=1$ and there is no z in $C(w')$, $z \neq y$, such that $R(w)(z)(f)=1$.

- (23) **the est^{rel}-K-w-C 3 1 2 [John said-w₃ 5 Tolstoy had written-w₅ (the) D₂(w₅)-long book-1] was W-P**
 K1 = [$\lambda w_1 \lambda w_2 . w_2 = w_1$]
 K2 = [$\lambda w_1 \lambda w_2 . w_2$ is a world compatible with what John says in w_1]
- (24) W&P is the unique y such that there is a function f from worlds to degrees such that for all worlds w' compatible with what John said in w , y is a $f(w')$ -long book, and there is no $z \in \llbracket [C] \rrbracket^g(w)$, such that for all worlds w' compatible with what John said in w' , z is a $f(w')$ -long book.

Notice that if we used the semantic reconstruction technique, we could lambda-in the superlative morpheme along with the Adj-N complex. But then we would run into the same problems that Bhatt and Hulsey & Sauerland run into.

1.6 The NPI problem

This is a hard problem. Some thoughts come to mind.

Bhatt assumes that NPIs need a local licenser. He relies on Linebarger's (1980, 1987) similar claim. But for Linebarger, the term "local licensing" means "no intervening quantifier" (where by "quantifier" she means something like *every*). For Bhatt, "local licensing" seems to mean "clause-mate-ness".

- (25) a. The committee didn't have any reservations.
 b. John didn't say that the committee had any reservations.
 c. John didn't say to anyone that the committee had any reservations.
 d. Did John ever say that the committee had any reservations?
- (26) a. John didn't give money to every charity.
 "It wasn't every charity that John gave money to"
 b. John didn't give any money to every charity.
 *"It wasn't every charity that John gave money to"

Clearly, *say* doesn't block negation from licensing the NPI in its complement. Moreover, *only*, which behaves like *longest* when it functions as an NP-internal modifier (as shown in (27) and (28)), licenses an NPI below *say* when it appears in other environments (see (29)).

- (27) The only book John said Tolstoy had written was War and Peace
 only >> say, say >> only
- (28) The only book John ever said Tolstoy had written was War and Peace
 The only book John said Tolstoy had ever written was War and Peace
- (29) a. Only John ever said that Bill had been to Paris.
 b. Only John said that Bill had ever been to Paris.
 c. Only John ever said that Bill had ever been to Paris.

(30) The longest book that John ever said that Tolstoy ever gave to anyone.

Conclusion

The superlative morpheme is external to the relative clause.

2. CASE II – *which*-questions

I argue, contra Rullmann and Beck (1998) and Beck and Rullmann (1999), that (what I call below) “external de dicto” readings are not a reconstruction effect.

2.1. The problem

Groenendijk and Stokhof 1984 observe that embedded *which*-questions are ambiguous between a de dicto and a de re reading.

(31) John knows which students left.

De re: John can pick out the students who left, without (necessarily) being aware that they are students.

De dicto: John can pick out the students who left, while being aware that they are students.

Let’s call this instance of de dicto, “external de dicto” (the source of the intensionality is the verb that embeds the question).

Rullmann and Beck observe that de dicto readings arise in matrix questions which contain intensional verbs.

(32) Which unicorn does John want to play with?

De re: which actual unicorns does John want to play with?

De dicto: which entities that are unicorns according to John does he want to play with?

Let’s call this instance of de dicto, “internal de dicto” (the source of the intensionality is in the question itself).

The “set of propositions analysis” (Karttunen-Hamblin), without reconstruction, accounts for neither kind:

(33) John knows in w the true propositions in $\{p:\text{there is a student}(w) x \text{ such that } p=\{w':x \text{ left in } w'\}\}$

(34) $\{p:\text{there is a unicorn}(w) x \text{ such that } p=\{w':\text{John wants}(w') \text{ to play with } x\}\}$

Rullmann and Beck’s syntactic reconstruction analysis is designed to account for both:

(35) John knows the true propositions in $\{p:\text{there is an } x \text{ such that } p=\{w':\text{the student}(w') x \text{ left}(w')\}\}$ ($=\{\text{the student John left, the student Bill left,}\dots\}$)

(36) $\{p:\text{there is an } x \text{ such that } p=\{w':\text{John wants}(w') \{w'':\text{John plays with the unicorn}(w'') x\}\}\}$

Rullmann and Beck’s analysis gives a uniform treatment to external and internal de dicto. But they are, in fact, different.

Not all embedding verbs allow “external de dicto” readings (cf. Sharvit 2002)

- (37) John doesn’t really know which students left. Indeed, he knows that Mary and Sally – the students who left – left, but he doesn’t know that they are students.
- (38) It didn’t really surprise John which students left. #Indeed, he didn’t expect Mary and Sally – the students who left – to leave, but he wasn’t aware that they are students.
- (39) John doesn’t really know which students left. Indeed, he knows that Mary and Sally – the students who left – left, but he also thinks that Fred is a student who left (when, in fact, Fred left but he is not a student).
- (40) It didn’t really surprise John which students left. #Indeed, he didn’t expect Mary and Sally – the students who left – to leave, but he also didn’t expect Fred to leave, and he thinks he is a student (when, in fact, Fred left but he is not a student).

But all embedding verbs allow “internal de dicto” readings (to the extent that these are “real” readings).

- (41) a. John knows which unicorns Bill wants to play with.
- b. It surprised John which unicorns Bill wanted to play with.

Therefore, we do not want a unified account of these two types of de dicto readings.

2.2 Why are the two de dicto readings different?

It is argued in Sharvit (2002) that weakly exhaustive veridical verbs (e.g., *surprise*) do not support (external) de dicto readings.

Weak vs. Strong Exhaustivity (Beck and Rullmann 1999; Groenendijk and Stokhof 1984, Lahiri 1991, Heim 1994)

- (42) John knows who left
- Weak reading: for every individual x who left, John knows that x left.
- Strong reading: for every individual x, John knows whether x left.

Evidence for the weak reading (e.g., Beck and Rullmann 1999)

- (43) John knows who left, but he has no idea who didn’t leave.

Evidence for the strong reading (Sharvit 2002)

- (44) John doesn’t REALLY know who left because, for example, Bill didn’t leave but John doesn’t know this.

Some verbs are inherently weak (Sharvit 2002)

- (45) It didn’t really surprise John who left. #For example, Bill didn’t leave but John wasn’t surprised by that.

We saw above ((40)-(38)) that *surprise* doesn't support external de dicto. Sharvit (2002) accounts for this fact as follows.

Heim (1994) accounts for strong exhaustivity and (external) de dicto readings by assuming a Hamblin-Karttunen semantics for questions, and two Answerhood operators, Ans-strong and Ans-weak. Ans-strong does two things at the same time: (a) it “extracts” a strong answer, and (b) it “extracts” (external) de dicto readings. Ans-weak “extracts” a weak answer, and crucially does NOT “extract” an external de dicto reading.

$$(46) \quad \text{Ans-weak}(Q)(w) = \cap \{p: Q(w)(p)=1 \text{ and } p(w)=1\}$$

$$\text{Ans-strong}(Q)(w) = \{w': \text{Ans-weak}(Q)(w') = \text{Ans-weak}(Q)(w)\}$$

$$(47) \quad \text{Ans-weak}(\{\langle w', p \rangle: \text{there is an } x \text{ such that } x \text{ is a student in } w' \text{ and } p = \{w'': x \text{ left in } w''\}\})(w) =$$

$$\{w': \text{John, Mary, and Bill left in } w'\}$$

$$(48) \quad \text{Ans-strong}(\{\langle w', p \rangle: \text{there is an } x \text{ such that } x \text{ is a student in } w' \text{ and } p = \{w'': x \text{ left in } w''\}\})(w) =$$

$$\{w'': \text{Ans-weak}(\{\langle w', p \rangle: \text{there is an } x \text{ such that } x \text{ is a student in } w' \text{ and } p = \{w'': x \text{ left in } w''\}\})(w'') = \text{Ans-weak}(\{\langle w', p \rangle: \text{there is an } x \text{ such that } x \text{ is a student in } w' \text{ and } p = \{w'': x \text{ left in } w''\}\})(w)\}$$

$$\{w'': \cap \{p: p \in \{q: \text{there is an } x \text{ such that } x \text{ is a student in } w'' \text{ and } p = \{x \text{ left}\}\} \text{ and } p(w'')=1\}$$

$$= \{w': \text{John, Mary, and Bill left in } w'\}$$

If we assume that **surprise** is inherently weak (i.e., its lexical semantics refers to Ans-weak only), and we assume that the **which**-phrase does not reconstruct, we can explain why it doesn't give rise to “external de dicto” readings.

$$(49) \quad \llbracket \text{It surprised-}w \text{ John which students left} \rrbracket = 1 \text{ iff John didn't expect in } \llbracket w \rrbracket \text{ Ans-weak}(\llbracket \text{which students left} \rrbracket)(\llbracket w \rrbracket)$$

$$(50) \quad \llbracket \text{John knows-weak-}w \text{ which students left} \rrbracket = 1 \text{ iff John believes in } \llbracket w \rrbracket \text{ Ans-weak}(\llbracket \text{which students left} \rrbracket)(\llbracket w \rrbracket)$$

$$(51) \quad \llbracket \text{John knows-strong-}w \text{ which students left} \rrbracket = 1 \text{ iff John believes in } \llbracket w \rrbracket \text{ Ans-strong}(\llbracket \text{which students left} \rrbracket)(\llbracket w \rrbracket)$$

For Rullmann and Beck, this is a problem, as they predict Ans-weak to also extract de dicto readings.

2.3 “Internal de dicto” – modalizing the *which*-phrase

$$(52) \quad \text{Which unicorn does John want to play with?}$$

- (53) $\{p:\text{there is an } x \text{ such that for all } w^* \text{ such that } C(w)(w^*), x \text{ is a unicorn in } w^* \text{ and } p=\{w':\text{John wants}(w') \{w'':\text{John plays}(w'') \text{ with } x\}\}\}$

$C1 = [\lambda w1\lambda w2 . w2=w1]$

$C2 = [\lambda w1\lambda w2 . w2 \text{ is a belief world of John in } w1]$

- (54) It surprised John which students left.

- (55) It surprised(w) John Ans-weak($\{\langle w', p \rangle : \text{there is an } x \text{ such that for all } w^* \text{ such that } C(w')(w^*), x \text{ is a student in } w^* \text{ and } p=\{w'':x \text{ left in } w''\}\}$)(w)

Ans-weak($\{\langle w', p \rangle : \text{there is an } x \text{ such that for all } w^* \text{ such that } C(w')(w^*), x \text{ is a student in } w^* \text{ and } p=\{w'':x \text{ left in } w''\}\}$)(w)

What if $C=[\lambda w1\lambda w2 . w2 \text{ is a belief world of John in } w1]$?

Then we predict that if John is wrong about who the students are, he will be surprised that the leavers who he thinks are students left (i.e., what he didn't expect: {that Paul left, that David left}). That is to say, we predict an "internal de dicto" reading.

The Beck and Rullmann analysis doesn't predict this reading.

- (56) It surprised(w) John Ans-weak($\{\langle w', p \rangle : \text{there is an } x \text{ such that } p=\{w'':\text{the student } x \text{ left in } w''\}\}$)(w)

What John didn't expect: that the actual students left.

Conclusion

No reconstruction of *which*-phrases. However, we cannot conclude that there is no LF, since we have to assume *wh*-movement even when it appears "downstairs" on the surface.

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