

Adjectival Modifiers and Relative Clauses 2

1 Some background on Superlatives

Szabolcsi (1986), Heim (1995), Sharvit and Stateva (2002) among many others.

1.1 Absolute vs. Comparative Readings

- (1) John climbed the highest mountain.
 - a. Absolute reading: John climbed Mt. Everest.
 - b. Comparative reading: Of the locally salient people who climbed mountains, John climbed the highest mountain.

The contents of the comparison set in the comparative reading seem to be influenced by focus.

- (2) John is angriest at Bill.
 - a. [John]_F is angriest at Bill.
Of the people angry at Bill, John is the angriest.
 - b. John is angriest at [Bill]_F.
Of the people that John is angry at, John is angriest at Bill.

Another option:

I've always enjoyed his sense of humor, even when I was angriest at him.

Absolute readings seem to be unavailable with comparatives of quantity.

- (3) a. John read the most books.
b. John read the fewest books.

An initial proposal: superlatives have a contextual restriction, whose contents are influenced by focus.

1.2 Locality Effects on Comparative Readings

Unlike *only*, superlatives do not need to c-command the focus they associate with.

- (4) a. John gave the most presents to Sue.
(→ *-est* can associate with John.)
b. John *only* gave that book to Sue.
(→ *only* cannot associate with John.)

But as Szabolcsi (1986) pointed out, the superlative and the DP it associates with cannot be too far away.

- (5) a. John gave the most presents to Sue.
b. John wants to give the most presents to Sue.
c. ?John demanded that Sue be given the most presents.
d. ?*John believes that Sue was given the most presents.
e. *John likes the student who was given the most presents.
(* under the reading where *-est* associates with John.)

Szabolcsi (1986) proposes that *-est* needs to undergo LF-movement to be in the vicinity of the element it associates with.

When the required LF-movement is blocked, the relevant interpretation is unavailable.

1.3 Split Readings: comparing desires

Another argument for the movement of *-est* comes from the existence of *split* readings.

- (6) John wants to climb the highest mountain.
 - a. Split Reading: people want to climb mountains of various heights. The height that John has in mind is more than the height other people do.

-est moves over *want*, *high mountain* stays below *want*.

- b. Non-Split Reading: John is very competitive. He wants to climb a mountain higher than one anyone else climbs.

-est stays below *want*.

If we do not move *-est*, the split reading cannot be derived straightforwardly (but see Sharvit and Stateva (2002) for a detailed proposal).

1.4 A question of type: *dt* or *det*

1.4.1 Background Assumptions about Adjectival Semantics

- Adjectives are relations between degrees and individuals.

(7) John is tall.

John is d_{pos} -tall.

(tall to a contextually suitable degree)

$$\llbracket \text{tall} \rrbracket = \lambda d \lambda x [\text{tall}(d)(x) = 1]$$

- Monotonicity Assumption

(8) If x is P to degree d , then x is also P to every non-zero degree d' less than d .

This leads to the counterintuitive result that if John is 6 feet tall, then he is also 5 ft. tall and so on. I will assume that the oddness of the utterance 'John is 5ft. tall' when his (maximal) height is 6ft. falls out from conversational implicatures similar to the oddness of saying 'John has one daughter' when 'John has two daughters' is true.

- Movement of *-est* creates a degree abstraction:

(9) *-est* leaves behind a trace of type d .

a. Surface:A-est.....

b. LF: *-est* λd d -A

1.4.2 A 3-place relation

This is the semantics that the surface syntax suggests:

(10) Mt. Everest is the highest mountain.

(Mt. Everest) (*-est*(C)($\lambda d \lambda x [\text{high}(x, d) \wedge \text{mountain}(x)]$))

(11) $\llbracket \text{-est} \rrbracket(\text{C})(\text{R})(\text{y})$ is defined only if (a) $y \in C$, and (b) for all $x \in C$, there is a degree d s.t. $R(x, d) = 1$.

When defined, $\llbracket \text{-est} \rrbracket(\text{C})(\text{R})(\text{y}) = 1$ iff there is a degree d s.t. $R(y, d) = 1$ and for all $z \in C$ s.t. $z \neq y$, $R(z, d) = 0$.

Pros: generalizes naturally to comparative readings with relative clauses, questions, and control constructions - assuming they all yield predicates.

Cons: connection with focus-sensitivity left unexplained. Analysis works well only if the focused element is the 'external argument' of superlative.

1.4.3 A 2-place relation

(12) $\text{est}(C)(P) = 1 \iff \exists d [P(d) \wedge \forall Q [Q \neq P \wedge Q \in C \rightarrow \neg Q(d)]]$
 (P is a property of degrees, C a set of such properties)
 (*-est* has no external argument under this analysis.)

John is angriest at Mary

LF: [C-est] λd [John is d -angry at Mary]

Depending upon the context (and associated focus-marking), C can be:

(a) the set of degree properties of the form $\lambda d [x \text{ is } d\text{-angry at Mary}]$

(b) the set of degree properties of the form λd [John is d -angry at x]

(from Heim 1995)

In the above example, the alternatives in C are generated by focus. In other cases, there is no focus - just a covert element such as a *wh*-trace, a relative clause trace, or a PRO.

(13) a. Who_i does John think t_i got the fewest presents?

LF: Who_x [John thinks [*est* λd [x got d -few presents]]]

b. The boy who_i John thinks t_i got the fewest presents

LF: the boy who_x [John thinks [*est* λd [x got d -few presents]]]

c. John wants [PRO to get the fewest presents].

LF: John wants *est* λd [PRO to get d -few presents]

So the pros and cons are reversed - the focus cases work well, but the non-focus cases become problematic.

2 The interpretation of Adjectival Modifiers

The following cases of ambiguity can be characterized as involving a ‘high’ and a ‘low’ construal of the adjectival modifier respectively.

- (14) The first book that John said that Tolstoy had written
‘high’ reading \approx In 1990, John said that Tolstoy had written *Anna Karenina*; in 1991, John said that Tolstoy had written *War and Peace*. Hence the NP in (14) is *Anna Karenina*.
(i.e. order of *saying* matters, order of *writing* is irrelevant)
‘low’ reading \approx John said that the first book that Tolstoy had written was *War and Peace*. Hence the NP in (14) is *War and Peace*.
(i.e. order of *writing* matters, order of *saying* is irrelevant)
- (15) a. The only book that John said that Tolstoy had written
b. The longest book that John said that Tolstoy had written

2.1 Interpreting the low reading LF

- (16) Low reading LF:
the λx [that John said that -est λd [Tolstoy wrote [the d -long book x]]]

How is ‘[-est λd [Tolstoy wrote [the d -long book x]]]’ interpreted?

The alternatives are generated by varying over the variable associated with the relative clause abstraction.

- (17) $C = \{\lambda d$ [Tolstoy wrote [the d -long book w]],
 λd [Tolstoy wrote [the d -long book x]],
 λd [Tolstoy wrote [the d -long book y]],
 \dots ,
 λd [Tolstoy wrote [the d -long book z]]}

Given the above semantics for -est and associated assumptions about how C is determined, the subexpression -est λd [Tolstoy wrote [the d -long book x]] is equivalent to x was the longest book that Tolstoy wrote.

- This is the desired result, but it depends upon a particular assumption about how C is set. Sharvit (2004) and Hulsey and Sauerland (to appear) question this assumption and provide alternative proposals.

3 Sharvit (2004)’s Objections

- Central Point: low readings do not involve reconstruction of -est. The only element that reconstructs is the head NP.

3.1 Overgeneration 1

Sharvit (2004) notes that the LF proposed by Bhatt (2002) for the low reading only works if C is generated by varying the embedded variable.

Relative clauses that contain superlatives do not in general force such a setting of C .

- (18) a. The boy [who, [Mary gave the most expensive present to t_i]]

Case where relativized variable is varied to get C :

$$C = \{\lambda d$$
 [Mary gave [the d -much expensive present] to w],
 λd [Mary gave [the d -much expensive present] to x],
 λd [Mary gave [the d -much expensive present] to y],
 \dots ,
 λd [Mary gave [the d -much expensive present] to z]]

the boy x s.t. out of the people Mary gave presents to, x got the most expensive present (i.e. the most expensive present given by Mary went to x).

- b. The boy [who, [[Mary]_F gave the most expensive present to t_i]]

Case where another focused element is varied to get C :

$$C = \{\lambda d$$
 [Mary gave [the d -much expensive present] to x],
 λd [Gina gave [the d -much expensive present] to x],
 λd [Tara gave [the d -much expensive present] to x],
 \dots ,
 λd [Sara gave [the d -much expensive present] to x]]

the boy x s.t. out of the people who gave presents to him, Mary’s present was the most expensive (i.e. his most expensive present came from Mary).

But focusing *Tolstoy* does not seem to yield a comparable reading.

- (19) Low reading LF with Tolstoy focused:
 the λx [that John said that -est λd [[Tolstoy]_F wrote [the d -long book x]]
 $C = \{\lambda d$ [Tolstoy wrote [the d -long book x]],
 λd [Chekhov wrote [the d -long book x]],
 λd [Pushkin wrote [the d -long book x]],
 \dots
 λd [Nabokov wrote [the d -long book x]]}

The truth conditions predicted here seem to be rather weak - with the above C , λx [that John said that -est λd [[Tolstoy]_F wrote [the d -long book x]] will pick out any book that John said that Tolstoy wrote as long as we make the plausible assumption that John didn't say that more than one author wrote any given book.

The full DP will be defined in all (and only) the cases where there is a unique book which John said that Tolstoy wrote.

Such a reading seems to be absent.

3.2 Sharvit (2004)'s Proposal

- -est does not reconstruct

- the adjective (with the degree variable) + the NP reconstructs

- (20) Low reading LF for Sharvit (2004):
 the -est $\lambda d \lambda x$ [that John said that [Tolstoy wrote [the d -long book x]]]
- (21) Assumptions about the semantics of -est and say:
- [-est](C)(R)(y) is defined only if (a) $y \in C$, and (b) for all $x \in C$, there is a degree d s.t. $R(x, d) = 1$.
 When defined, [-est](C)(R)(y) = 1 iff there is a degree d s.t. $R(y, d) = 1$ and for all $z \in C$ s.t. $z \neq y$, $R(z, d) = 0$.
 - For any world w , proposition p , and individual x , [say](w)(p)(x) = 1 iff for all worlds w' compatible with what x says in w , $p(w') = 1$

Setting aside the intensional semantics of say for simplicity, let's see how the LF in (20) does.

Consider the following scenario:

- (22) John says:
- Tolstoy wrote the 450 pages long War and Peace.
 - Tolstoy wrote the 300 pages long Anna Karenina

- Tolstoy wrote the 290 pages long *Kavkas*.
- Tolstoy wrote the 420 pages long *Prin*.

- (20) picks out *War and Peace*.

Note though that John never said that *War and Peace* was the longest book that Tolstoy ever wrote. He could very well deny that *War and Peace* was the longest book that Tolstoy ever wrote.

This is not quite the low reading. To see this consider another scenario:

- (23) John says: *War and Peace* is the longest book that Tolstoy wrote. He doesn't mention its length - he might not even know it or the names/lengths of other novels by Tolstoy - he just has reasons to believe that *War and Peace* is the longest Tolstoy novel.

(20) does not work in such a scenario.

To get the full low reading, we need something more - a mechanism that in effect puts -est in the scope of say - be it syntactic or semantic.

Sharvit (2004):13 provides a semantic mechanism for the purpose which intensionalizes -est and has its world argument be bound by say. The resulting semantic object is rather complex and I omit the details here.

4 Hulsey and Sauerland (to appear)'s Proposal

- Sharvit (2004) takes the problems that arise in Bhatt (2002)'s proposal with respect to the setting of the C variable to be a general argument against reconstruction of *-est*.

- Hulsey and Sauerland (to appear) take a different line, arguing that the problem with the setting of C can be remedied if we exploit intermediate traces.

4.1 Background Assumptions

- The world arguments of *long* and *book* must be bound within the complement of *believe*.

- 'the_x P ' is a shorthand for 'the $\lambda y(P(y) \wedge x = y)$ '.

- so even though P is not shown as taking any input, it actually is and it is because of this that we will treat it as if it of type t .

- A 3-place semantics for *-est* is assumed:

(24) $\llbracket \text{-est} \rrbracket (C)(R)(y)$ is defined only if (a) $y \in C$, and (b) for all $x \in C$, there is a degree d s.t. $R(x, d) = 1$.

When defined, $\llbracket \text{-est} \rrbracket (C)(R)(y) = 1$ iff there is a degree d s.t. $R(y, d) = 1$ and for all $z \in C$ s.t. $z \neq y$, $R(z, d) = 0$.

4.2 Many LFs

4.2.1 LFs without Intermediate Traces

- (25) a. $\lambda w \dots$ the $\text{-est}(C) \lambda d \lambda x$ [John believes(w)
 $\lambda w' x \lambda x$ [Tolstoy wrote the_x [long(d)(w') \wedge book(w')]]]
- b. $\lambda w \dots$ the λx [John believes(w)
 $\lambda w' x \lambda x$ [Tolstoy wrote the_x $\text{-est}(C) \lambda d$ [long(d)(w') \wedge book(w')]]]

4.2.2 Exploiting Intermediate Traces: Option 1

- (26) the [longest book]_i [John believes [t_i [Tolstoy wrote t'_i]]]

(the [longest book]_i [John believes [[longest book]_i [Tolstoy wrote [longest book]_i]]])

(27) Potential LFs

- a. $\lambda w \dots$ the $\text{-est}(C) \lambda d \lambda x$ [John believes(w)
 $\lambda w' x \lambda x$ [Tolstoy wrote the_x [long(d)(w') \wedge book(w')]]]
- b. $\lambda w \dots$ the λx [John believes(w)
 $\lambda w' x \lambda x$ [Tolstoy wrote the_x $\text{-est}(C) \lambda d$ [long(d)(w') \wedge book(w')]]]
- c. $\lambda w \dots$ the λx [John believes(w)
 $\lambda w' x \text{-est}(C) \lambda d \lambda x$ [Tolstoy the_x [long(d)(w') \wedge book(w')]]]

→ note that (25a) is equivalent to (27a) and (25b) to (27b).

- 'the_x [long(d)(w') \wedge book(w')]' is defined for a pair (x, d) iff x is d -long in w' .

w' are the worlds of John's belief worlds.

There is something here that I had some trouble unpacking:

...the second argument of *-est* in (53a) is only defined for a pair (x, d) if the book x is actually d -long, and then it is true. But since it cannot be false of any pair (x, d) , (53a) necessarily results in a presupposition failure.

It is the case that if x is not a d -long book in w' , 'the_x [long(d)(w') \wedge book(w')]' is undefined leading to the whole expression becoming undefined.

But I was unclear about the *then it is true* bit: it seemed to me that from x being d -long in w' , it did not follow that Tolstoy wrote x in w' .

Such cases get excluded from C by the presuppositional component of (4.2.2).

- (28) $\llbracket \text{-est} \rrbracket (C)(R)(y)$ is defined only if (a) $y \in C$, and (b) for all $x \in C$, there is a degree d s.t. $R(x, d) = 1$.
 When defined, $\llbracket \text{-est} \rrbracket (C)(R)(y) = 1$ iff there is a degree d s.t. $R(y, d) = 1$ and for all $z \in C$ s.t. $z \neq y$, $R(z, d) = 0$.

For (x, d) 's s.t. they are d -long books in w' but have not been written by Tolstoy, the predicate of degrees and individuals (R) will not satisfy the presupposition that every member of C but satisfy R to some degree.

Now we are left with $\langle x, d \rangle$'s s.t. they are d -long books in w' and have been written by Tolstoy. Such cases will always satisfy R .

For -est to pick out a single element from R , R needs to be false for some $\langle x, d \rangle$ pair. Since this is not possible, we always end up with presupposition failure.

→ This is also the case with (27c).

- Hulsey and Sauerland (to appear) argue that (27b) is also ruled out, but for pragmatic reasons.

'the _{x} $\text{-est}(C) \lambda d [\text{long}(d)(w') \wedge \text{book}(w')]$ ' picks out the longest book in C in w' . The whole relative clause is defined only for this book and either picks out this book (if John thinks Tolstoy wrote it) or nothing.

Hulsey and Sauerland (to appear) suggest that (27b) is blocked by a pragmatic condition according to which a restrictive relative clause cannot be used to express functions that are defined for only one individual (thus different from a relative clause like who is tallest).

Instead, they suggest that an appositive needs to be used here:

- (29) the 'longest book', which John believes Tolstoy wrote
(quotes indicate that scare quotes intonation is required.)

4.2.3 Exploiting Intermediate Traces: Option 2

Late Merger of Adjective in the intermediate trace position.¹

- (30) Potential LFs

$$\begin{aligned} \text{a. } & \lambda w \dots \text{the } \text{-est}(C) \lambda d \lambda x [\text{John believes}_{(w)} \\ & \lambda w' x \lambda x [\text{long}_x(d)(w') \wedge \text{Tolstoy wrote the}_x [\text{book}(w')]]] \\ & = \lambda w \dots \text{the } \text{-est}(C) \lambda d \lambda x [\text{John believes}_{(w)} \\ & \lambda w' [\text{long}_x(d)(w') \wedge \text{Tolstoy wrote the}_x [\text{book}(w')]]] \end{aligned}$$

¹The LFs shown below are not completely faithful to the LFs in Hulsey and Sauerland (to appear), ex. 53. Their (53d, e) seem to involve a type mismatch. I have moved the λx a bit to avoid the type mismatch.

- b. $\lambda w \dots \text{the } \lambda x [\text{John believes}_{(w)}$
 $\lambda w' x \text{-est}(C) \lambda d \lambda x [\text{long}_x(d)(w') \wedge \text{Tolstoy wrote the}_x$
 $[\text{book}(w')]]]$

As was the case with the LF that Sharvit (2004) adopts, where -est is not in the scope of the embedding predicate, (30a) runs into problems because it does not force 'exhaustivity'. This problem does not arise with (30b).

One way to make (30a) work better is to enrich the semantics of believe. We will return to this point after the discussion of Heycock (2003).

- Choosing between (30a and b):

- (31) John is sure that out of Tolstoy's novels, War and Peace has 1000 pages, and Anna Karenina is either 50 pages longer or shorter than that. Furthermore he believes that all other novels by Tolstoy are shorter than 900 pages.

Relevant Belief Worlds:

- w_1 : War and Peace: 1000 pages, Anna Karenina: 1050 pages
 w_2 : War and Peace: 1000 pages, Anna Karenina: 950 pages

Assumption about the semantics of adjectives: monotonic semantics i.e. if a book is 1000 pages long, then it is also 900 pages long and so on.

- (32) I am reading the longest book that John said that Tolstoy wrote.
 a. Prediction of (30a): well-defined, should pick out War and Peace
 b. Prediction of (30b): presupposition failure
 Intuition: presupposition failure

→ Putative support for (30b).

5 Heycock (2003)'s Analysis

Heycock (2003) shows that the distribution of 'low' readings is limited in ways that do not immediately follow from a raising analysis.

She argues that the particular shape of these restrictions suggests an entirely different analysis that does not involve head raising/reconstruction.

5.1 Nonsuperlative Modifiers

Ordinary adjectives also seem to give rise to putative low readings:

- (33) the wonderful books that Siouxsie said that Lydia had written

But unlike the superlative cases seen earlier, low readings require a scare quote intonation.

Such readings seem to be available even without an intensional embedding predicate as long as a scare quotes intonation is available.

- (34) the wonderful books that Lydia has written

In fact, Heycock (2003) points out that such readings seem to be available even when there is no relative clause:

- (35) Siouxsie was always going on about the books that Lydia had written. But I've read those wonderful books and they are complete rubbish.

For these reasons, Bhatt (2002) and Heycock (2003) focus on low readings with superlative-like modifiers. Hulsey and Sauerland (to appear), however, do not give up on such cases.

Explanation for the scare quotes intonation requirement:

- (36) John believes that the thousand page book is interesting.
- a. 'the thousand page book' could be a 1000 page book just in John's beliefs
→ world variable of *thousand page book* bound by *believe*.
 - b. 'the thousand page book' could be a real 1000 page book but John could think it was something else.
→ world variable of *thousand page book* linked to world of evaluation.

Both *thousand page* and *book* can have their own world variables and these can be contra-indexed.

- (37) John believes that the thousand page section of wall will keep him entertained.
- a. Scenario 1: John is renting a new apartment. The previous occupant has painted the picture of a bookshelf on the wall, but John mistakes the picture for a real bookshelf. In particular, he forms the belief that one thick volume in the painted shelf has one-thousand pages and will keep him entertained.
 - b. Scenario 2: John is renting another new apartment. The previous occupant has left behind a bookshelf with one-thousand page volume in it. John, however, perhaps because he suffered through Scenario 1, believes that the bookshelf is a painted-on-the-wall fake. One of John's hobbies is cleaning and repainting walls, and he forms the belief that working on the section of the wall that he takes the book to be will keep him entertained.

Requirement: any time the world variables of two parts of an NP are contra-indexed, the part whose world variable is locally bound receives scare quotes intonation.

If there is no contra-indexation of variables, a low reading does not seem to require a scare-quotes intonation:

- (38) The thousand page book that John believes he bought turned out to be a DVD.

Low readings in the absence of relative clauses/embedding intensional verbs: Hulsey and Sauerland (to appear) claim that superlative low readings also surface without relative clauses:

- (39) Siouxsie was always going on about the new Tolstoy book she bought and that it's the longest by Tolstoy. But I've read that longest book and it's a lot shorter than 'War and Peace'.

What about cases where there is no embedding predicate in the relative clause:

- (40) I've read the longest book Tolstoy wrote.

- Hulsey and Sauerland (to appear)'s conclusion: 'low' readings of adjectival modifiers are parallel to low readings found with superlatives.

5.2 Intervention Effects

Bhatt (2002) observed that a negation on the embedding intensional predicate blocks low readings:

- (41) a. This is the first book that John didn't say that Antonia wrote.
 b. This is the longest book that John didn't say that Antonia wrote.
 c. This is the only book that John didn't say that Antonia wrote.

Low readings are also blocked by negative verbs like *doubt* and *deny*:

- (42) a. This is the first book that John denied that Antonia wrote.
 b. This is the longest book that John doubted that Antonia wrote.

5.2.1 Connections with Amount Quantification

Even though an explicit theory is not provided in Bhatt (2002), it is suggested that the above facts are related to intervention effects found with amount quantification (see Kroch (1989), Cinque (1990), Heycock (1999), Beck (1996) among others).

- (43) a. How many articles does the editor want to have in this volume?
 i. for which n the editor wants to have n -articles in this volume?
 (consistent with the editor not having considered any particular articles yet)
 ii. for which n there are n -many articles that the editor wants to have in this volume?
 (the editor has article that s/he wants to publish in this volume; how many are there?)
 b. How many articles does the editor not want to have in this volume?
 i. **unavailable**: for which n the editor does not want to have n -articles in this volume?
 (consistent with the editor not having considered any particular articles yet)
 ii. **available**: for which n there are n -many articles that the editor does not want to have in this volume?

(the editor has article that s/he wants to publish in this volume; how many are there?)

5.2.2 Divergence from Amount Quantification

Heycock (2003) suggests that these 'intervention' effects seem to only affect superlative modifiers and not idiom/anaphor interpretation.

- (44) a. *few* causes intervention for amount quantification:

How much do those/*few people weigh?

- b. *few* also blocks low readings:

This is the longest book that few people said that Tolstoy wrote.
 high reading: of the books that few people said that Tolstoy wrote, this is the longest.

*low reading: This is the x s.t. few people said that x is the longest book T. wrote.

- c. but it does not block idiom interpretation:

This is the kind of headway that few people can make.

Further putative anaphor reconstruction is not blocked by negation/negative predicates:

- (45) a. Mary saw the picture of himself_i that John_i didn't show his mother.
 b. The picture of himself_i that everybody_i denied keeping was always eventually discovered in some drawer.

- But note that in principle, the anaphor could be reconstructing to a position below the subject but above negation.

- (46) a. This is the only picture of himself_i that Mary said John_i didn't show to his mother.
 b. This is the only man taller than himself_i that Mary said John_i hadn't picked a fight with.
 c. This is the only picture of himself_i that Bill_i thought Mary would ever buy.
 d. This is the only picture of himself_i that Bill_i thought Mary would buy.

What happens if we block that possibility?

- (47) a. ()This is the only picture of himself_i that Mary didn't say that John_i showed to his mother.
b. ()This is the only man taller than himself_i that Mary didn't say that John_i had picked a fight with.

5.2.3 Predicate based Restrictions

The central observation in Heycock (2003) is that the class of embedding predicates that disallow low readings is bigger than the class of predicate that cause intervention effects for amount quantification.

According to Heycock (2003), *decide/be willing to/mistakenly think/agree/concede/prove* block low readings.

- (48) (slight modifications of her examples)
- a. This is the longest article that they have **decided** to publish.
- i. high: Of the articles that they have decided to publish, this is the longest.
ii. ???low: This is the x s.t. they have decided that x will be the longest article they will publish.
- b. This is the longest book that we **mistakenly thought** Antonia had written.
- i. high: Of the books that we mistakenly thought Antonia had written, this is the longest.
ii. ???low: This is the x s.t. we mistakenly thought that x was the longest book Antonia had written.
- c. This is the longest book that they **agreed** that Antonia had written.
- i. high: Of the books that they agreed that Antonia had written, this is the longest.
ii. (???)low: This is the x that they agreed that x was the longest book A. had written.

They do not, however, cause intervention effects for amount quantification:

- (49) amount readings are available:

- a. How many articles did they decide/are they willing to publish?
b. How many books did you mistakenly think that Antonia had written?
c. How many books did they agree/concede/prove that Antonia was willing to write?

5.3 Enter Neg-Raising

Heycock (2003) relates the distribution of low readings to the availability of Neg Raising (see Horn (1978)/Horn (1989)).

- (50) a. *think* allows for Neg Raising:

I don't think they like me.
has an interpretation as
I think they don't like me.

- b. *know* does not allow for Neg Raising:

They don't know that John has left.
has no interpretation as
They know that John hasn't left.

Even though Heycock (2003) does not provide a detailed proposal as to how low readings are generated, it is clear that she assumes that the availability of Neg Raising is necessary for a low reading to be generated.

5.3.1 Non-Neg-Raising Predicates

She claims that predicates that block Neg Raising also block low readings.

- (51) Non-Neg-Raising Predicates
- a. factives: *know, regret*
b. implicatives: *manage to*
c. weak epistemic operators: *be possible*
d. strong epistemic operators: *be certain*
e. weak deontic operators: *can/could*
f. strong deontic operators: *need/be necessary*
g. others: *agree, concede, prove*

- (52) a. The longest book that we know she wrote
(\neq The x s.t. we know that x was the longest book she wrote.)
- b. Those are the most famous people he managed to befriend.
(\neq The x s.t. he managed it to be the case that x were the most famous people he befriended.)
- c. This is the longest book that it is possible he wrote.
(\neq The x s.t. it is possible that x is the longest book he wrote.)
- d. This is the longest book that it is certain he wrote.
(\neq The x s.t. it is possible that x is the longest book he wrote.)

5.3.2 Neg Raising Predicates

- (53) Neg-Raising Predicates
- believe, think
 - want
 - 'mid scalar' epistemic operators: likely, probable
 - 'mid scalar' deontic operators: should, ought to
- (54) Neg Raising predicates allow for low readings (from Heycock (2003):8-9)
- Those are the only people that he **wanted** to insult.
(possible reading: the x s.t. he wanted to insult only these people x)
 - This is the only book that it's likely that he wrote.
(possible reading: the x s.t. it is likely that he wrote only x .)
 - This is the only offence that he should claim to have committed.
(possible reading: the x s.t. he should claim that he committed only offence x .)

5.3.3 The effect of adverbials

Véloudis (1982) noted that VP adverbs can block Neg Raising.

- (55) a. I'm so relieved! For a moment I didn't think that you loved me.
b. #I'm so relieved! For a moment I didn't mistakenly think that you loved me.

Presence of VP-adverbs also blocks low readings:

- (56) This is the only book that I mistakenly/foolishly thought that he had written.
(\neq This is the x s.t. I mistakenly/foolishly thought that x was the only book that he had written.)

Heycock (2003) uses the adverbial blocking of Neg Raising and the necessity of Neg Raising for low readings to provide an explanation for the following observation:

- (57) NPI in embedding predicate blocks low reading:
- the first book that John ever said that Tolstoy wrote
 - the only book that John ever said that Tolstoy wrote
 - the longest book that John ever said that Tolstoy wrote

According to Heycock (2003), *ever* makes Neg Raising unavailable and hence blocks the low reading.

• But the facts seem to be more general. It seems that low reading is also blocked by a non-adverbial NPI in the embedding predicate.

- (58) non-adverbial NPI in embedding predicate also blocks low reading:
- the first book that anyone said that Tolstoy wrote
 - the only book that anyone said that Tolstoy wrote
 - the longest book that anyone said that Tolstoy wrote

And it is not clear that such NPIs block Neg Raising:

- (59) a. John doesn't know that I don't think that Mary loves me. (has an interpretation: John doesn't know that I think that Mary doesn't love me.)
b. John doesn't know that anyone came.

- c. ()John doesn't know that anyone doesn't think that Mary loves them.
- d. If anyone thinks that Mary loves them, they are deluded.
- e. ()If anyone doesn't think that Mary loves them, they are on the right track.

5.3.4 What about say?

say is not a Neg Raising predicate:

- (60) I didn't say he was here.
 ≠ I said he was here.

Heycock (2003) proposes that say when it has a low reading functions as an evidential and is Neg Raising in that guise.

- (61) This is the only book that John said that Tolstoy wrote.
 (≈ This is the only book that Tolstoy wrote, according to John.)

In support of her contention, she notes that if we force the true verb of communication reading, the low reading becomes hard to get:

- (62) a. This is the only book that John said to me that Tolstoy wrote.
 b. This is the only book that John said on that occasion that Tolstoy wrote.

• An alternate line of attack is (being) developed in Bhatt and Sharvit (in progress) where the factor responsible is not Neg Raising but the existence of an entailment relationship between low and high readings.

6 Summing Up

• Heycock (2003) shows that the lexical semantics of embedding predicates constrain the availability of low readings.

• She argues that Neg Raising is the relevant factor, but this is not so clear.

• Further, she does not provide an actual procedure to generate the low readings and Neg Raising, by itself, does not yield the right interpretation.

• An alternate proposal: reconstruct head and adjective but not the superlative into the scope of the embedding predicate (as argued for by Sharvit (2004) and explored in Hulsev and Sauerland (to appear)).

The lexical semantics of certain predicates will allow for a 'low' reading and others will not.

Semantic assumption about *believe*:

- (63) $\llbracket \text{believe} \rrbracket(w)(P)(x)$ is defined only if:
 $\forall w' \in \text{Dox}(x,w): P(w') = 1$, or
 $\forall w' \in \text{Dox}(x,w): P(w') = 0$.

(where $\text{Dox}(x,w)$ is the set of all worlds compatible with what x believes in w)

The above assumption predicts that *John believes AK is d-long* is undefined for degrees between 950 and 1050. This correctly predicts a presupposition violation.

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