

# On the interaction of adjectival modifiers and relative clauses

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## 1 Introduction

In the recent literature on relative clauses, it has been claimed that empirical evidence of various kinds supports a “raising/promotion” analysis in the tradition of Schachter 1973, Vergnaud 1973, Áfarli 1994, Kayne 1994, Bianchi 1995, 1999, 2000, for either some or all relatives: that is, an analysis in which the NP is merged in some position internal to the relative clause.

(1) [DP the [NP book ]<sub>i</sub> [ which t<sub>i</sub> ]<sub>j</sub> [ he wrote t<sub>j</sub> ]]

This is in contrast to a “head external” analysis in which the NP originates outside the relative clause, and what moves is a (null or overt) relative operator:

(2) [DP the [NP book ] [ which ]<sub>i</sub> [he wrote t<sub>i</sub> ]]

Some of the arguments for this analysis are based on general theoretical positions which are independent of facts about relative clauses (in particular, if all adjunction is to the left, as proposed in Kayne 1994, Chomsky 1995, then the kind of analysis in (2), in which the relative clause is a right-adjunct, is ruled out in principle). Other arguments however have been based on particular facts about relative clauses. This paper is concerned with one of the most recent arguments of this latter type: the argument from the interpretation of nominal modifiers, as described and analysed in Bhatt 2002, and subsequently reanalysed in Hulseley and Sauerland 2002.

Bhatt’s central new empirical point is that adjectival modifiers of the head NP of a relative clause can be interpreted within the scope of a propositional attitude verb. The modifiers with which he is most concerned are **superlatives**, the ordinals **first** and **last**, and **only**. He exemplifies the core empirical distinction with with (3) and (4) (his (20) and (21)):

(3) the first book that John said Tolstoy had written  
*‘High’ reading:*

In 1990, John said that Tolstoy had written *Anna Karenina*; in 1991 John said that Tolstoy had written *War and Peace*. Hence the NP is *Anna Karenina*.

(I.e., order of *saying* matters, order of *writing* is irrelevant.)

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*'Low' reading:*

John said that the first book that Tolstoy had written was *War and Peace*. Hence the NP is *War and Peace*.

(I.e. order of *writing* matters, order of *saying* is irrelevant.)

- (4) a. the only book that John said that Tolstoy had written.

*'High' reading:*

x is the only book about which John said that Tolstoy had written x

*'Low' reading:*

What John said can be paraphrased as 'x is the only book that Tolstoy wrote'

- b. the longest book that John said that Tolstoy had written.

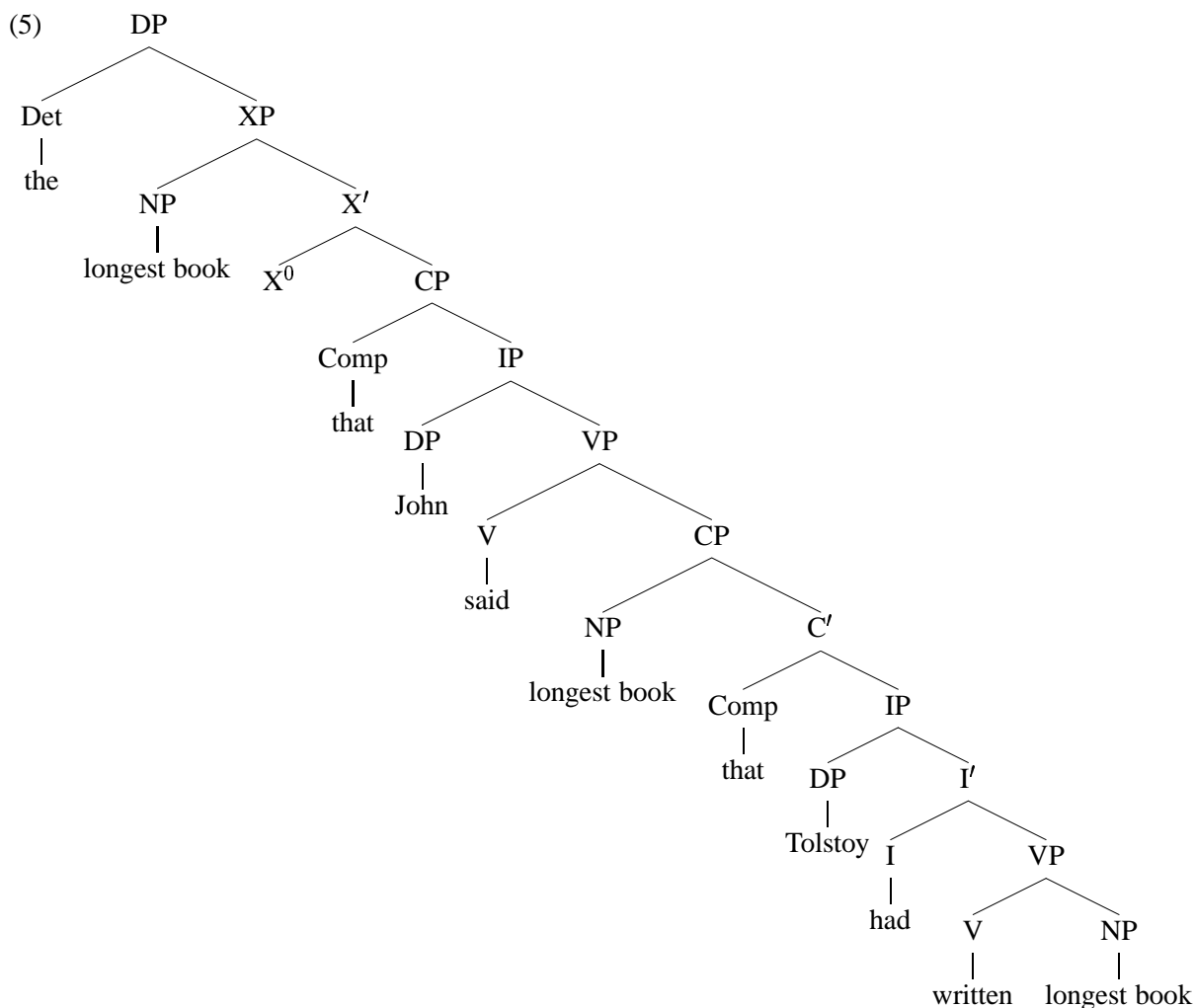
*'High' reading:*

x is the longest book out of the books about which John said that Tolstoy had written them

*'Low' reading:*

What John said can be paraphrased as 'x is the longest book that Tolstoy wrote'

The basis of Bhatt's explanation for the existence of these different readings is an analysis of relative clauses in which the head NP and its modifiers originate within the relative clause (in the position of the "gap"); subsequently this constituent moves from this position to a position to the left of the clause. Crucially, this movement results in a chain of copies, and "we have the option of deciding which copy of the head NP to interpret." I will not go into the details of the derivation here; the essential point is that subsequent LF processes have access to a representation along the lines of (5).



Low and intermediate readings are the result of interpreting copies other than the highest one in the chain.

Bhatt (2002) and Hulsey and Sauerland (2002) differ in their analysis of the low readings, but in both cases it is either asserted or assumed that these readings are generally available, and that they must be accounted for by some type of “reconstruction” into the relative (where “reconstruction” is a (now misleading) term for the interpretation of a low copy within the chain formed by movement). In this paper I will argue, however, that a slightly more extensive look at the interpretation of adjectival modifiers shows that the facts cited in these papers are not representative, and that the shape of the phenomenon is significantly different. I will argue that adjectival modifiers—whether superlatives, *only*, or others—cannot be interpreted within the scope of a propositional attitude verb within the relative clause. The apparent “low” readings are an exceptional case, which arise in the main from a widespread tendency to interpret negation with a lower scope than the structure warrants (the phenomenon of “Neg-Raising”). In consequence, the interpretation of modifiers cannot be taken as an argument for the raising analysis of relative clauses (and could in fact be construed as an argument against it).

## 2 Some cases to set aside: nonsuperlative adjectival modifiers

First let us delimit a little more closely the type of data that are at issue. In Bhatt 2002, p. 71, it is claimed that “high and low readings are available with numeral modifiers when they occur with *the*, with numeral-like uses of *few/many* when they occur with *the*, and with adjectives in general.” Since Bhatt’s article does not discuss scope with respect to quantifiers in the relative clause, we take it that these high and low readings concern the relative scope of these items and propositional attitude verbs, the type of example discussed in his article.

Bhatt states in a footnote, however, that “evaluative” adjectives probably do not generate high and low readings by virtue of reconstruction. His inclusion of “adjectives in general” in the list of modifiers showing “low” readings is then mysterious; it may be that it is an inadvertent holdover from an earlier draft. I believe that the conclusion drawn in the footnote that such cases have to be excluded from consideration is correct. As Bhatt says, in (6) (his (i), footnote 18) it is possible to ascribe the judgment that the books are wonderful in (6) to either the speaker or to Siouxsie, but the apparent “low” reading (ascription of the judgment to Siouxsie) does not require the relative clause. This can be seen, for example, in (7).

- (6) the wonderful books that Siouxsie said that Lydia had written
- (7) Siouxsie was always going on about the books that Lydia had written. But I’ve read those wonderful books and they’re complete rubbish.

As far as I can tell this pattern is in fact found with all adjectives, not only obviously evaluative ones like *wonderful*. That is, the comments above hold equally for *green*, *tall*, *French*, or *fifty-page*. Hulsey and Sauerland 2002 do not share Bhatt’s qualms about attributing the acceptability of (8) (their (69)) to the possibility of syntactic reconstruction into the relative. But again similar readings arise in the absence of this syntactic structure, as illustrated in (9):

- (8) We discovered that the 50-page book that the teacher said Tolstoy wrote has 500 pages.
- (9) He’s such a con-man. You remember that famous 50-page book that turned out to be a 2-page collection of limericks?

So we agree with Bhatt in his footnote persona (and contra Hulsey and Sauerland 2002) that a low/high contrast of the kind at issue is in fact not found for “adjectives in general”; either the adjective has no subjective interpretation at all (in Hulsey & Sauerland’s terms, no world variable argument to be bound), in which case there can in principle be no high/low distinction, or the varying readings are independent of the relative clause construction.

## 3 Reconstruction and Neg-Raising

If we thus set aside the existence of a distinct “low” reading for “adjectives in general,” there remain the cases of superlatives, numeral modifiers, *only*, and ordinals. With respect to ordinals, the only examples actually discussed are *first* and *last*, which are both ordinals and superlatives. For the moment I will follow Bhatt in concentrating on superlatives (including the superlative ordinals *first* and *last*) and *only*.

### 3.1 Restrictions on reconstructed readings: Intervention Effect I

Bhatt points out an sharp and striking restriction on low/reconstructed readings for these modifiers: they are blocked by intervening negation. Thus he observes that (10a,b) (his (30a), (31a)) do not have a low reading:

- (10) a. This is the first book that John didn't say that Antonia wrote.  $\neq$   
This is the book that John didn't say that Antonia wrote first.  
b. This is the first book that John denied that Antonia wrote.  $\neq$   
This is the book that John denied that Antonia wrote first.

This effect Bhatt relates to the well-known pattern concerning “amount quantification:” (Cinque 1989, Cinque 1990, Kroch 1989, Rizzi 1990, Dobrovie-Sorin 1992, Szabolcsi and Zwarts 1992, Heycock 1995, Beck 1996, etc). As illustrated in (11)–(12), one reading for questioned amount QPs is blocked by intervening negation (including negative verbs such as *doubt* or *deny*):

- (11) How many articles does the editor want to have in this volume?  
a. for which  $n$  the editor wants to have  $n$ -many articles in this volume  
(*consistent with the editor not having considered any particular articles yet*)  
b. for which  $n$  there are  $n$ -many articles that the editor wants to have in this volume  
(*the editor has articles that s/he wants to publish in this volume; how many are there?*)
- (12) How many articles does the editor not want to have in this volume?  
a. ~~for which  $n$  the editor does not want to have  $n$ -many articles in this volume~~  
b. for which  $n$  there are  $n$ -many articles that the editor does not want to have in this volume

Bhatt himself points out in a footnote that it is not clear an intervention effect of this kind should show up for the low reading of relatives; but it seems reasonable to take the effect as arising only (but not always) when there is a derivation involving movement+“reconstruction.” And indeed Bhatt cites these intervention effects as further support for “[the] proposal that the derivation of ‘low’ readings involves A' movement and reconstruction.”

The first thing to note about this pattern is that it is essential that only the adjectival modifier is blocked from reconstructing.

The first thing to note about this intervention effect is that it is restricted to the ‘low’ reading for adjectival modifiers and is not reproduced with respect to the interpretation of idioms or the binding of reflexive pronouns, other phenomena argued to depend on reconstruction and hence on the raising analysis. So, for example, downward-entailing *few* creates an intervention effect for “amount quantification,” as illustrated in (13):

- (13) How much do those/\*few people weigh.

And it also blocks the ‘low’ reading of *first*:

- (14) That is the first book that few people said she read.  $\neq$   
That is the book that few people said she read before she read the others.

But it allows the idiom *make headway* (cf the discussion in Hulsey and Sauerland 2002 around their example of this idiom):

- (15) That is the kind of headway that few people can make.

Similarly, negation (including the negative verb *deny*), does not prevent a reflexive in the head NP to be bound by an element within the relative:

- (16) a. Mary saw the picture of himself<sub>i</sub> that John<sub>i</sub> didn't show his mother.  
 b. The picture of himself<sub>i</sub> that everybody<sub>i</sub> denied keeping was always discovered eventually in some drawer.

It is quite unclear how this distinction could be implemented. In an example like (17) the modifier *only* is prevented from reconstructing, while the NP including the anaphor must.

- (17) This is the only picture of himself<sub>i</sub> that Mary said John<sub>i</sub> didn't show to his mother.

Conversely, in Bhatt's analysis the presence of *ever* in the lowest clause in (18a) forces reconstruction to that clause (the facts concerning *ever* will be discussed in more detail below); but the binding of the reflexive by the subject of the higher clause is no less possible than it is in (18b):

- (18) a. This is the only picture of himself<sub>i</sub> that Bill<sub>i</sub> thought Mary would ever buy.  
 b. This is the only picture of himself<sub>i</sub> that Bill<sub>i</sub> thought Mary would buy.

Even worse, in (19) the anaphor is itself contained in a modifier:

- (19) This is the only man taller than himself<sub>i</sub> that Mary said John<sub>i</sub> hadn't picked a fight with.

One could perhaps escape the acutest form of the problem (that represented by (17)–(19)) by arguing that anaphor-binding in these cases might be licensed in ways other than reconstruction (a possibility that Bhatt, but not Hulsey & Sauerland, concedes, for reasons other than those given here); of course though that would amount to *substituting* the argument for the raising analysis from the 'low' reading for modifiers for the argument from for anaphor binding, rather than adding to it.

The point that I want to focus on here, however, is that "low" readings for the relevant modifiers are blocked in a much wider range of cases than just those involving negation.<sup>1</sup>

- (20) a. [They have been arguing for ages over the order in which to publish the various submissions, but at last . . .] This is the first article that they have (finally) decided to publish.  
 ≠  
 This is the article that they have (finally) decided to publish before publishing all the other articles.  
 b. This is the first book that we mistakenly thought that Antonia had written. ≠  
 This is the book that we mistakenly thought that Antonia had written before writing all the other books.  
 c. This is the first book that they agreed/conceded/proved that Antonia wrote. ≠  
 This is the book that they agreed/conceded/proved that Antonia wrote before she wrote all the other books.
- (21) a. [Finally they got him to agree that he would not publish all his books but would limit himself to one:] This is the only book that the banned author was willing to publish ≠  
 This is the *x* s.t. the author was willing for *x* to be the only book that he would publish.  
 b. This is the only book that I mistakenly/foolishly thought that he had written. ≠

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<sup>1</sup>The adverb *finally* is included in (20a) because this clarifies the relevant readings; it is in parentheses because, as we will see, adverbs themselves prevent the low reading. In my judgement the low reading is absent with or without the adverbial in (20a), even though the readings may be harder to distinguish.

This is the  $x$  s.t. I mistakenly/foolishly thought that  $x$  was the only book that he had written.

- c. This is the only book that they agreed/conceded/proved that he wrote.  $\neq$   
This is the  $x$  s.t. they agreed/conceded/proved  $x$  was the only book that he wrote.

Notice that none of the embedding predicates in the examples above blocks the relevant kind of amount reading (the (b) paraphrases below):

- (22) How many articles did they decide/are they willing to publish?  
a. for which  $n$ : there are  $n$ -many articles that they decided/are willing to publish  
b. for which  $n$ : they decided/are willing to publish  $n$ -many articles
- (23) How many books did you mistakenly think that Antonia had written?  
a. for which  $n$ : there are  $n$ -many books that you mistakenly thought that Antonia had written  
b. for which  $n$ : you mistakenly thought that Antonia had written  $n$ -many books
- (24) How many books did they agree/concede/prove that Antonia was planning to write?  
a. for which  $n$ : there are  $n$ -many books that they agreed/conceded/proved that Antonia was planning to write  
b. for which  $n$ : they agreed/conceded/proved that Antonia was planning to write  $n$ -many books.

It seems, then, that there is no reason to attribute the missing readings in (10) to the “inner island” effect of negation evidenced in amount quantification; these are in fact just one subcase of a much more general prohibition. But now this leaves us with the problem of how to characterise the pattern of interpretations.

### 3.2 Negative entailments

A clue to what is going on here is the observation that all the best cases of modifiers with ‘low’ readings (superlatives, including *first* and *last*, and *only*) license NPIs, a fact pointed out in Bhatt’s article. It is argued in Giannakidou 1997, following Linebarger 1980, 1987, that they do this by virtue of establishing a nonveridical context because of the negative entailment that they generate.<sup>2</sup> Thus (25) can be decomposed as in (26a), where  $g$  and  $k$  are degrees,  $g > k$ , and has the negative entailment in (26c) (Giannakidou 1997, p. 126).

- (25) *Anna Karenina* is the longest book that Tolstoy wrote.
- (26) a. *Anna Karenina* is  $g$  long.  
b. All books  $x$  that Tolstoy wrote are such that there is a degree  $k$  such that the degree of  $x$ ’s length does not exceed  $k$   
c.  $\neg$  [Tolstoy wrote a book other than *Anna Karenina*  $g$  long]

One way to build this into the semantics would be to take the denotation of *-est* to be something along the lines of (27) (Anastasia Giannakidou, personal communication):

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<sup>2</sup>Giannakidou refers to this as a conventional implicature rather than an entailment, but I am not sure why.

It should be observed that this account is only an approximation; as pointed out in Horn 1995, the scalar adverb *almost* has a negative entailment but fails to license NPIs, while *barely* has no such entailment but does license them.

- (27)  $\lambda Q \lambda P \lambda y \iota d [Q(y, d) \& P(y) \& \text{it is not the case that [there exists an individual } x \text{ and a degree } d' \text{ such that } x \text{ is other than } y \text{ and } Q(x, d') \& P(x) \& d' > d]]$

My claim is that the “low” reading of modifiers is the result of interpreting the negation in the entailment with lower scope:

- (28) *Anna Karenina* is the longest book that Jennifer thinks Tolstoy wrote.  
 a.  $\neg$  [Jennifer thinks Tolstoy wrote a book other than *Anna Karenina* g long]  
 “High” reading  
 b. Jennifer thinks  $\neg$  [Tolstoy wrote a book other than *Anna Karenina* g long]  
 “Low” reading

That is to say, within the entailment we find the phenomenon referred to as “Neg-Raising.”

I will assume the account of “Neg-Raising” (NR) in Horn 1989 as a *short-circuited implicature* from the *contradictory* outer-neg reading to a *contrary* inner-neg reading. Horn gives an analysis of why only certain classes of predicates allow this implicature. I will not go into his analysis here in detail; the crucial point for my purposes is that the generalisations that he establishes for NR also characterise the distribution of high and low readings for the modifiers we are interested in.

Thus, **Factives** block NR,

- (29) They didn’t know that he had arrived.  
*has no interpretation as*  
~~They knew that he hadn’t arrived.~~

and they also block low readings for modifiers:

- (30) the first book that we know she wrote  
~~the book that we know was the first one that she wrote~~

Equally, **Implicatives** (predicates whose complements are entailed rather than presupposed) like *manage to* also block NR, in contrast to nonimplicatives like *want to*.

- (31) a. He didn’t manage to steal his sister’s books.  
~~He managed not to steal his sister’s books.~~  
 b. He didn’t want to read his sister’s books.  
 He wanted not to read his sister’s books.

Equally, implicatives block low readings for modifiers. Thus (32a) can have the reading (32c), as well as (32b), but (33a) only allows the reading in (32b):

- (32) a. Those are the only people that he wanted to insult.  
 b. Those are the people s.t. he only wanted to insult them.  
 c. Those are the people s.t. he wanted to insult only them.  
 (33) a. Those are the only people that he managed to insult.  
 b. Those are the people s.t. he only managed to insult them.  
 c. ~~Those are the people s.t. he managed to insult only them (he successfully avoided insulting others).~~

**Weak** epistemic operators like *be possible*, and **strong** operators like *be certain* block NR, while operators with a midscalar value like *be likely*, *probable* allow it.

- (34) a. It wasn't possible for him to talk to me.  
~~It was possible for him not to talk to me.~~  
 b. It isn't certain that he is here.  
~~It is certain that he is not here.~~  
 c. It isn't likely/probable that they will come.  
 It's likely/probable that they won't come.

And the same pattern shows up in the readings of relative clauses:

- (35) a. That is the only water that it is possible for him to drink.  
 b. This is the water s.t. it is not possible for him drink anything other than that water (picky guy that he is).  
 c. ~~This is the water s.t. it is possible for him not to drink anything other than that water (tall that he is).~~
- (36) a. This is the only book that it is certain that he wrote.  
 b. This is the book s.t. it is not certain that he wrote any book other than that.  
 c. ~~This is the book s.t. it is certain that he did not write any book other than that.~~
- (37) a. This is the only book that it's likely that he wrote.  
 b. This is the book s.t. it is not likely that he wrote any book other than that.  
 c. This is the book s.t. it is likely that he didn't write any book other than that.

And the same is true of the deontic operators *can/could* (weak), *need, be necessary* (strong), versus *should, ought to* (midscalar):

- (38) a. That is the only offence that he could / needed to claim to have committed.  
 b. That is the offence s.t. he could not / did not need to claim that he had committed an offence other than that.  
 c. ~~That is the offence s.t. he could/needed to claim not to have committed an offence other than that.~~
- (39) a. That is the only offence that should claim to have committed.  
 b. That is the offence s.t. he should not claim to have committed an offence other than that.  
 c. That is the offence s.t. he should claim not to have committed an offence other than that.

The predicates in (20) and (21) also block NR, as can easily be verified. To take just one example, it was noted by Veloudis (1982) that VP-adverbs block NR, as shown in (40):

- (40) 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.

—and we have seen in (21b), repeated here, that VP-adverbs also block the “low” reading of modifiers in relatives

- (21) b. This is the only book that I mistakenly/foolishly thought that he had written. ≠  
 This is the *x* s.t. I mistakenly/foolishly thought that *x* was the only book that he had written.

Notice that while factives also produce intervention effects for amount quantification, and hence would block the low reading also on Bhatt's account, this is not true of the cases in (38), any more than the cases in (20) and (21); it is perfectly possible to get the “nonreferential” reading of the amount

quantifier in (41).

(41) How much do I need to (say that I) weigh in order to be allowed to compete?

Our conclusion is that the distribution of the “low” readings of modifiers in all these cases is predicted extremely well by the hypothesis that it is due to the kind of implicature documented for Neg-Raising. An account in terms of the Intervention Effects produced by “inner islands,” besides its weakness as an explanation, fails to capture the distribution of these readings.

There is however one conspicuous case where this account as it stands makes the wrong prediction. Bhatt’s original examples of ‘low’ readings all involve the verb *say*. But, like other true verbs of communication, *say* only marginally allows NR, as shown by the comparison of (42a) with (42b), for example:<sup>3</sup>

- (42) a. I didn’t think he was here.  
I thought he wasn’t here.  
b. I didn’t say he was here.  
~~I said he wasn’t here.~~

Thus my analysis incorrectly predicts that the “low” reading should be blocked with such verbs of communication. However, there is an alternative reason for the possibility of the low reading with *say*, namely that *X says* may be interpreted as a type of *evidential*.<sup>4</sup> Thus (43a) is interpreted exactly as (43b):

- (43) a. This is the only book that John said Tolstoy wrote.  
b. This is the only book that Tolstoy wrote, according to John.

Support for this comes from two facts. One is that the availability of the low reading is greatly reduced if material is added which forces a reading of *say* as a true verb of communication:

- (44) 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.

The second is that a similar phenomenon can be observed outside relative clauses, with adverbial *only*. Thus, (45) seems a perfectly coherent exchange; and (46a) seems to license the interpretation in (46b), in contrast to (47a):

- (45) A So I have two daughters.  
B Really? I thought you only said you had one!
- (46) a. I only think you should have one.  
I think you should only have one.  
b. He only said you should have one.  
He said you should only have one.
- (47) a. I don’t think you should have more than one ice-cream.  
I think you shouldn’t have more than one ice-cream.  
b. He didn’t say you should have more than one ice-cream.  
~~He said you shouldn’t have more than one ice-cream.~~

<sup>3</sup>It is pointed out in Horn 1978, pp. 205–206 that instances of *emphsay* that “admit of judgmental rather than communicative readings” may trigger NR.

<sup>4</sup>Thanks to Manfred Krifka to suggesting this possibility.

### 3.3 The licensing of the Negative Polarity Item “ever” & Intervention Effect II

We have just seen that VP-adverbs block NR (and hence, under our account, the “low reading” of modifiers). This blocking effect of adverbial modification extends immediately to the effect of *ever* in a “high” position in the relative clause. Bhatt points out that (48) (his (27b)) has only the high reading for *only*:

(48) the only book that John ever said that Tolstoy wrote

I agree with this judgment; but now we can see that this is just a special case of the blocking effect of adverbs on the “Neg-Raised” reading, showing up equally in (20b), (21b), or (49):

(49) the only book that John frequently said/thought that Tolstoy wrote  $\neq$   
the  $x$  s.t. John frequently said/thought that  $x$  is the only book that Tolstoy wrote

Bhatt’s own account of the behaviour of *ever* is that it must be licensed by *only* occurring in the same clause; hence in (48) *only* has to be interpreted in the higher clause in order for *ever* to be licensed. On his account this is also why (50) has only the ‘low’ reading:

(50) the only book that John said that Tolstoy had ever written

Besides its failure to extend to (49), this account has the problem that it relies on the requirement that *ever* can only be licensed by a clause-mate. It has been argued in the literature (see for example Zwarts 1995, Giannakidou 1997) that NPIs fall into two classes, *strong*, and *weak*; the latter having a wider range of licensors, and also allowing “long-distance” licensing. *Ever* appears to fall squarely in the class of weak NPIs: it is licensed in questions, the antecedent of conditionals, the restrictions of universal quantifiers, free relatives, *too*-clauses, sentence-comparatives, superlatives, monotone decreasing quantifiers, and negative predicates.<sup>5</sup> It is thus expected that it should not require a clause-mate licensor, and indeed this is the case:

(51) He didn’t tell me that he had ever been to France.

Bhatt recognises that long-distance licensing for *ever* is attested, but speculates that the difference may be in the licensors, and that “ordinals, nominal *only*, superlatives” may only be able to license an NPI in the same clause. This is a reasonable speculation, but without independent confirmation the account of the behaviour of *ever* in relatives remains circular: the distribution of *ever* in relative clauses is explained in terms of a locality condition which is motivated only by the distribution of *ever* in relative clauses.

There are two ways to provide independent evidence for this account, however. One is to consider licensors such as *every*, which should not (by hypothesis) reconstruct into the relative clause at all, and to see where they license NPIs such as *ever*. The other is to look at the distribution of *ever* in noun complement clauses.

The first thing that we observe is that a “clause-mate” condition is not quite the right way to state the locality principle, since *every* can license *ever* within the relative clause (into which it is not supposed to reconstruct); and, equally, ordinals, nominal *only*, and superlatives can license *ever* within their complement clause:

(52) Every book that he ever wrote began with the same sentence.

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<sup>5</sup>In this it patterns together with *any*; the only environments in which *any* can occur from which *ever* is banned appear to be those in which *any* has a free choice interpretation (e.g. in subjunctives, imperatives, with the future tense or modals).

- (53) a. This was the first indication that she would ever succeed.  
 b. This is the only proof that he ever intended to leave.  
 c. This is the best indication that he was ever here.

This is in contrast to the kind of strong NPIs Giannakidou discusses for Greek (*tipota* is a weak NPI when unstressed, but strong when stressed):

- (54) o monos anthropos pu ipe tipota/\*TIPOTA  
 the only person that said anything/anything  
 the only person that said anything

But it might be that licensing is possible across a single clause boundary only; this would still provide evidence for “reconstruction” of the licensing *only* or superlative. I think that Bhatt is correct that it is much harder to find long-distance licensing for *ever* by elements other than negation in the relative clause. This may be because, as stated earlier, *only* and the superlatives license NPIs *indirectly*, by virtue of a negative entailment. Nevertheless, long-distance licensing, even in these cases, does seem to be marginally possible.

- (55) I have bought every book that I think I will ever need.  
 (56) a. This was the first indication that they thought she would ever succeed.  
 b. This is the only proof that they think I will ever be good enough.

But the use of an implicative or factive verb, for example, or the inclusion of an intervening VP-adverb, blocks the occurrence of the NPI:

- (57) \*I have read every book that they know/proved/stupidly say he ever wrote.  
 (58) \*This was the first indication that they knew/had proved/stupidly said she would ever succeed.

Although the NPIs seems to me to be somewhat better generally in the relatives (when there is a suitable NR-licensing predicate) than in the noun complement clauses, for reasons that remain unclear, the pattern here seems to be remarkably similar to the relatives considered by Bhatt. But in the cases we are considering now there is no available analysis in terms of “reconstruction.” Instead it appears that NPI licensing by these NP-internal elements is indeed restricted in comparison to licensing by *not* but that it is allowed by the possibility of an entailment where negation is low, just as we saw in the last section.

Finally, there is one piece of evidence concerning NPI licensing that is not only unexplained by the raising/reconstruction analysis, but constitutes evidence against it. Linebarger (1987) proposes a minimality requirement on polarity licensing that ensures no other logical operator can intervene between a polarity item and a licensing negation. I will not go into Linebarger’s analysis here, or the various proposals that have been made to improve on it (for example Jackson 1995); the relevant point is just to observe the intervention effect that is caused by, for example, the universal quantifier in (59b):<sup>6</sup>

- (59) a. I didn’t think that John had ever been there.  
 b. \*I didn’t think that everyone had ever been there.

Note that the same intervention effect arises when the licenser is *only*:

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<sup>6</sup>I am grateful to Klaus von Stechow for suggesting that I look at these cases.

- (60) a. I only think that one person here has ever been there.  
 b. \*I only think that everyone in one department has ever been there.

And it also shows up in the relative clauses that we have been considering:

- (61) a. That is the only book that I think John has ever read.  
 b. \*That is the only book that everyone thinks John has ever read.

But observe that if *only* has to reconstruct down into the lowest clause in order to license *ever* in (61a,b), there should be no intervention effect in (61b), as *only* would be lower than the quantifier.<sup>7</sup>

Thus the facts about NPI licensing are not only unexplained by the lowering analysis; they constitute evidence against it.

## 4 Some loose ends

### 4.1 Numerals

So far we have not discussed numerals such as *two*, *three*, or *few*. I do not know how to evaluate the claim that there is a distinct low reading for numerals in examples like (62):

- (62) the two books that John said that Tolstoy had finished

It is certainly true that such an example is interpreted differently from an example like (63), in that (62) is compatible with John specifically saying that Tolstoy had finished two books, while (63) is not:

- (63) two books that John said that Tolstoy had finished

But this difference simply follows from the semantics of the definite determiner; compare (64) and (65).

- (64) A: In my opinion, Pushkin wrote five good poems.  
 B: Yes, I know. \*(The) five poems you are talking about are my favourites too. (Cf. Three poems you are talking about are my favourites too.)

It is therefore not clear to us that numerals show anything about reconstruction.<sup>8</sup>

*Few* is a more interesting case, as here there appears to be a real possibility for distinguishable high and low interpretations. What we find is that again the low interpretation is available just when the predicates are of the type that allow Neg Raising, as in (65), contrasting with e.g. (66):<sup>9</sup>

<sup>7</sup>Note that quantifiers such as *everyone* do not cause an “intervention effect” for amount quantification:

- (i) How much did everyone think he weighed?

<sup>8</sup>I limit myself here, as Bhatt does, do a discussion of the scope of numerals with respect to propositional attitude verbs. The question of scope interaction of numerals with respect to quantifiers is discussed in (Alexopoulou and Heycock 2002).

<sup>9</sup>This is true even when the relative appears to be able to get the “degree” reading which Grosu and Landman (1998) (and others following them) argue necessarily involves interpretation of the low copy inside the relative:

- (i) The defendant was relieved at the few crimes that the prosecution/defence were able to prove that he had committed.

- (65) a. Those are the few books that I think she has read.  
 b. Those are the few books that she is likely to read.
- (66) Those were the few crimes that #the defence/the prosecution were able to prove that the defendant had committed.  
*Compare:*  
 The defence/#the prosecution were able to prove that the defendant had committed few crimes.

If we adopt Giannakidou’s claim that downward entailing DPs also give rise to a negative implicature, and that it is this that allows them the license NPIs (Giannakidou 1997, p. 126), this pattern is exactly as expected under the account proposed here.

#### 4.2 Ordinals, or: Which came first, AD or BC? (Be careful)

I have argued that the low reading of the ordinals *first* and *last* is attributable to a low reading for the negative in the entailment that they generate by virtue of being superlatives. But this account will not extend to the possibility of interpreting (67a) with the “low” reading paraphrased in (67b):

- (67) a. the twentieth mistake that I think she made  
 b. the mistake that I think she made after she made nineteen others

Ordinals (including *first* and *last* are like comparatives and superlatives in that they involve a set of degree properties but different from them in how much of the property they specify; instead a suitable property with a temporal or locative argument must somehow be determined from the context. Thus if you are told that Jennifer is the tallest of Jennifer, Laura, and Helen, you it makes no sense to ask “tallest with respect to what?” But if you are told that she was the first, you precisely do need to determine what the relevant property is.

Bhatt does not discuss the derivation of these examples in detail, but his account appears to make the assumption that an embedded predicate (like *make* in (67a)) provides the property against which the ordinal is evaluated *iff* the ordinal is reconstructed back down and adjoins to the clause containing that predicate. For example, by virtue of interpreting the lowest copy of the NP *first book* in (68a), the result is a representation along the lines of (68b), paraphrased in (68c) (note that the paraphrase still involves a relative with *first* as an adjectival modifier).

- (68) a. the first book that John said that Tolstoy wrote  
 b. the  $\lambda x$  [that John said *first*[book  $x$ ] that [Tolstoy wrote  $x$ ]]  
 c. the  $x$  s.t. John said that  $x$  is the first book that Tolstoy wrote

Examples with more embedding can have intermediate readings if intermediate copies are interpreted, so one LF for (69a) (Bhatt’s (28)) is (69b):

- (69) a. the first book that John said that Dan told Mary that Antonia wrote  
 b. the  $\lambda x$  [that John said *first*[book  $x$ ] that [Dan told Mary [that Antonia wrote  $x$ ]]]  
 c. the  $x$  s.t. John said that the first book that Dan told Mary that Antonia wrote was  $x$  (on the higher reading of this *first*)

What these representations assume (this is clear from the text), but do not really make explicit, is that by virtue of the copy of *first book* being adjoined to a clause, the property with the temporal argument

is determined by the verb in that clause. So in (68) it is the “order of writing that matters”, in (69) it is the order of Dan telling Mary.

I take it that Bhatt cannot be assuming that this is because *first* is somehow reconstructed back into an adverbial position, as in a sentence like *Tolstoy wrote Anna Karenina first*. If this were possible, then (70b) should have (at least) the interpretation of (70a).

- (70) a. the potatoes that I ate first  
b. the first potatoes that I ate

But of course (70a) has one interpretation (probably the most salient one) in which I ate the potatoes before I ate other things; (70b) is *only* appropriate if the comparison is with other *potatoes* that I ate.<sup>10</sup>

Assuming that reconstruction to the adverbial position cannot be what is proposed, however, it is not at all obvious that the observable variation in what determines the relevant property should be fully determined by the syntactic position of the interpreted copy. Certainly we know that in some cases at least (when the ordinal is the only modifier of the noun) the property must be constructed from the context. Now consider the example in (71):

- (71) This is the second mammal that we know emerged from the water.

There is a reading for the relative (probably the most salient one) where *second* is interpreted relative to times at which other mammals emerged from the water. This appears to correspond to Bhatt’s low reading:

- (72) the  $x$  s.t. we know *second*[mammal, $x$ ] that  $x$  emerged from the water.

But this possibility would be blocked, on Bhatt’s account, as *know* is a factive and thus acts as an intervenor. And indeed this representation is not quite right in any case, because (71) does not have a meaning where the assertion that this mammal emerged from the water before all other mammals is within the scope of *know*. (71) is perfectly compatible with a situation in which we do *not* know that that this was the second mammal to reach dry land; a better paraphrase is (73):

- (73) This is a mammal that we know emerged from the water and it is the second such mammal [on a time scale along which are placed the times at which different mammals emerged from the water]

Thus it seems that we must be able to use material from the embedded clause to construct the relevant property without “reconstructing” the NP down into the scope of *know*. In this paper I will not attempt an analysis of what constrains possible scales for ordinals, and the extent to which these might be determined syntactically or otherwise; I confine myself to noting that the evidence above suggests that it cannot be reconstruction of the ordinal.

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<sup>10</sup>Adverbial *first* always allows for comparison with other things, even when it is immediately adjacent to the noun phrase:

- (i) I ate first these potatoes (and then the peas).

Of course it is possible to facilitate a reading where the contrast is within the noun phrase by the use of focal stress on *these*, but this is only one possible use of the sentence, and follows from general principles about contrastive focus.

Further, in a number of Germanic languages closely related to English the translations of *only* in adverbial in in NP-modifier distinction are lexically distinct (for example, German *nur* vs. *einzig*).

## 5 Conclusion

In this paper I have argued that the central cases of “low” readings for adjectival modifiers of a noun that is further modified by a relative clause occur with modifiers that generate negative entailments. These entailments may further license the “short-circuited implicatures” referred to as Neg Raising (Horn 1989), and it is this phenomenon which is responsible for the “low” interpretations. Unquestionably many mysteries remain (how Neg Raising should be formalised is a notoriously difficult problem), but at the least this view models with some accuracy the otherwise surprisingly limited distribution of these readings.

In Bhatt 2002 it is argued that the low readings are the result of reconstruction of the noun and the modifier into the relative clause, and hence that they constitute evidence for the “raising analysis” of relative clauses. If I am correct, such reconstruction is not necessary to account for the interpretations available; and in fact if it necessarily gives rise to “low” readings the system will overgenerate massively. Whether or not this constitutes evidence against the raising analysis of relative clauses depends on whether this analysis really does entail the existence of low readings. If it does, the facts presented here suggest that it must be revised.

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