

# Appealing to superlative clauses

## Or how to split the scope of superlative adjectives across intensional verbs

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### 1. Introduction: the superlative clause hypothesis

The general goal of this article is to defend the hypothesis that comparative clauses have superlative counterparts, which I will call the superlative clause hypothesis. While comparative clauses have been an extensive object of study, superlative clauses are only envisioned in highly restricted cases by a handful of studies. The present paper further argues for the existence of superlative clauses on the basis of cases involving an interaction between intensionality and superlatives. More generally, the argumentation (in the spirit of Gawron 1995) is guided by the hypothesis that due to their morphosyntactic and semantic similarities, comparative and superlative constructions should be given more parallel treatments than they have been so far, as detailed below and previewed by Table 1 focusing on analyses of what I will henceforth call the comparandum in English (i.e. the standard of comparison in the case of comparatives, and the domain of comparison in the case of superlatives).

Comparandum	Possible denotation		Possible structure	
	Degree(s)	Individual(s)	Clause	Phrase
<b>Standard of comparison (comparatives)</b>	Consensual	Controversial	Consensual (comparative clause)	Controversial
<b>Domain of comparison (superlatives)</b>	Controversial	Consensual	Controversial and scarcely studied (superlative clause)	Consensual

*Table 1 – State of the art about the comparandum in comparative and superlative constructions*

In languages like English, comparison constructions routinely involve comparative clauses, which can take different forms as illustrated in (1) (adapted from Kennedy & Merchant 2000 and Lechner 2020), which only includes clausal comparatives of superiority.

- (1) a. Ann is taller than Ben is.  
 b. The table is longer than the door is large.  
 c. Sally worked more intensively than Bill worked.  
 d. Ann visited Berlin more often than Cleo did Dubai.  
 e. John read more books than Mary did.  
 f. Pico wrote a more interesting novel than Brio wrote.

Comparative clauses are standardly treated as degree clauses expressing the so-called standard of comparison, that is, what is being compared to (see review in e.g. Lechner 2020). For example, the *than*-clause in (1)a is analyzed as denoting the extent, or degree, of Ben's tallness, which is compared to the extent, or degree, of Ann's tallness expressed by the matrix clause. More specifically, *than*-clauses are considered to involve implicit degree quantification, which allows them to complement the comparative degree head *-er/more* (whether it combines with predicative adjectives as in (1)a-b, adverbs as in (1)c-d, amount phrases as in (1)e or attributive adjectives as in (1)f). The gradable predicate (e.g. *tall*) can also be implicit in comparative deletion constructions such as (1)a (because of ellipsis or movement, depending on analyses), but must remain explicit in comparative subdeletion constructions such as (1)b. Like other

elliptical constructions, comparative clauses can furthermore involve standard types of ellipsis such as gapping in (1)d or VP deletion in (1)e.

Descriptively, the standard of comparison can alternatively be expressed by a phrase in so-called phrasal comparatives exemplified in (2): all *than*-clauses in (1) can be expressed by *than*-phrases in (2) yielding identical meanings except in the cases of subcomparatives ((1)b) and comparatives with gapping ((1)d).

- (2) a. Ann is taller than Ben.  
 b. The table is longer than the door.  
 c. Sally worked more intensively than Bill.  
 d. Ann visited Berlin more often than Cleo.  
 e. John read more books than Mary.  
 f. Pico wrote a more interesting novel than Brio.

As reviewed in Lechner (2020), it remains debated whether such phrasal comparatives should be treated as (further) elided versions of clausal comparatives as under the reduced clause analysis (see Heim 1985, Lechner 2001, i.a.) or as simple DPs as under the direct analysis (see Hankamer 1973, Kennedy 2009, i.a.) as represented in (3).<sup>1</sup>

- (3) a. Ann is taller [PP than [CP wh<sub>i</sub> Ben is ~~t<sub>i</sub>~~ tall]].  
 b. Ann is taller [PP than [DP Ben]].

In the former case (e.g. (3)a), all *than*-complements uniformly denote degrees (sets of degrees or maximal degrees, depending on analyses) and complement the same degree head *-er* taking two degree arguments to be compared. In the latter case (e.g. (3)b), only *than*-clauses denote degrees; *than*-phrases denote individuals, which requires postulating a different, three-place *-er* taking two individual arguments to be compared with respect to a property.

Superlative constructions express comparison in a similar way to comparative constructions, to which they are clearly related morpho-syntactically. In fact, superlative counterparts of (1) can easily be constructed as shown in (4) – the specificity of superlatives being to establish a comparison within a *set* (the domain of comparison) while comparatives relate only two elements (a matrix element – the correlate, e.g. Ann in (2)a – and the standard of comparison, e.g. Ben in (2)a). For instance, the extent of Ann’s tallness is evaluated with respect to the tallness of all relevant individuals in (4)a, while it is compared with only Ben’s in (1)a.

- (4) a. Ann is (the) tallest (of all).  
 b. The table is (the) longest (of all tables).  
 c. Sally worked (the) most intensively (that anyone did).  
 d. Ann visited Berlin (the) most often (that anyone did).  
 e. John read the most books (that any student did).  
 f. Pico wrote the most interesting novel (that anyone did).

<sup>1</sup> The same holds of comparatives involving measure phrases like (i), which will not be discussed in this article (see some discussion in e.g. Pancheva 2006). Further note that interestingly for our general purposes here, Tomaszewick (2020) argues that the superlative counterpart of measure phrases does exist in some languages like Polish or Turkish as in (ii), and analyzes them as modifiers of the comparison set.

(i) Ann is taller than 2m.  
 (ii) En yüksek 205cm gardirop satıyorum. [Turkish]  
 est high 205cm wardrobe I-sell  
 ‘The tallest wardrobe I sell is 205cm.’ (lit. ‘I sell a tallest 205cm wardrobe.’) (Tomaszewick 2020)

Despite their similarity, superlatives and comparatives are usually treated quite differently both syntactically and semantically (but see Gawron 1992, 1995 for a notable exception)<sup>2</sup>. In particular, the comparandum is standardly considered to be a set of *individuals* in superlative constructions, while in comparative constructions, it is standardly assumed to denote a (set of) *degree(s)*, and only assumed to denote an individual under some analyses (i.e. under versions of the direct analysis) or/and some languages (e.g. in Hindi or Japanese vs. English, see e.g. Bhatt & Takahashi 2011) as we mentioned above. For example, (5) is assumed to convey that the *mountain* climbed by John is compared with other *mountains* (with respect to their height).

(5) John climbed the highest mountain.

Under current analyses, this interpretation is achieved in two main ways. One type of analysis takes the noun phrase (e.g. *mountain*) to denote the domain of comparison (see von Stechow 1999, Farkas & Kiss 2000, Matushansky 2008, Krasikova 2012, Loccioni 2018, i.a.). Another type of analysis (Heim 1985, 1995/1999, i.a.) treats the domain of comparison as an implicit variable whose value is determined by context or can be expressed by overt partitives (e.g. *of all mountains*). In both cases, the superlative morpheme *-est* takes three arguments – an individual (e.g. John’s mountain), a domain of comparison (e.g. all contextually relevant mountains), and a gradable predicate (e.g. *high* or *high mountain* depending on analyses) – and is thus comparable to the controversial three-place *-er*.

This type of analysis is uncontroversial for so-called absolute readings of superlatives, that is, when the comparison (e.g. between John’s and others’ mountains in (5)) is absolute (e.g. John climbed the highest of all mountains, i.e. Mount Everest). The analysis of so-called relative (or comparative) readings is more debated (see Heim 1985, Szabolsci 1986, Gawron 1995, Heim 1995/1999, Romero 2011, Tomaszewicz 2020, i.a.). Under this reading, the comparison is made relatively (e.g. relative to other climbers in (5): John climbed a higher mountain than anyone else did). The *in situ* theory attributes the difference between absolute and relative readings to contextual dependency: in (5), for example, the type of interpretation depends on how the domain of comparison, i.e. the set of relevant mountains, is construed, e.g. as the set of all mountains on earth or as the set of mountains climbed by all contextually relevant people. The movement theory (Heim 1985, 1995/1999, Szabolsci 1986, i.a.), however, treats the difference between absolute and relative readings as a case of genuine ambiguity deriving from different scopal possibilities of the superlative morpheme *-est* (partly influenced by focus, see Ross 1964, Jackendoff 1972, Szabolsci 1986, Gawron 1995, Heim 1995/1999). In both cases though, illustrated in (6)a and in (6)b respectively, the domain of comparison C remains a set of individuals: a set of mountains in (6)a and a set of climbers in (6)b.

- (6) a. John climbed the C-est high mountain.
- b. John C-est climbed a high mountain.
- c. C-est John climbed a high mountain.

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<sup>2</sup> Gawron’s (1992, 1995) goal is to treat uniformly some ambiguities found in both comparatives and superlatives. Specifically, he argues that both comparatives and superlatives have implicit degree clause restrictors partly determined by ellipsis (analyzed as higher order unification). In this respect, the present article clearly follows in its footsteps (even if it adopts a different view on ellipsis). However, Gawron’s (1992, 1995) main empirical basis differs from that of the present paper, which concentrates on various kinds of interaction between superlatives and intensional predicates (but see section 3.2.1 for discussion about one of Gawron’s directly relevant examples).

But there is yet a third theory, illustrated in (6)c, which crucially impacts the standard view on domains of comparison. Under this hypothesis advanced by Heim (1995/1999) as a possible alternative to the hypothesis in (6)b, the comparandum C is not a set of individuals, but a set of (sets/properties of) degrees determined by focus (see details in section 2.1.4); under this view, (5) basically expresses a comparison between the maximal *degree of height* of the mountain climbed by John and that of mountains climbed by other relevant climbers. Importantly, this hypothesis thus brings the superlative morpheme *-est* closer to the standardly accepted, two-place comparative morpheme *-er*,<sup>3</sup> since *-est* is here assumed to take two degree arguments (cf. Romero 2011, Tomaszewicz 2020).

Furthermore, two independent studies (Romero 2013, Howard 2014) propose that C as a set of sets or properties of degrees can be syntactically expressed as a clause in some restricted configurations such as (7)a and (7)b.

- (7) a. Mary sang the loudest [that anyone in the group has ever sung]. (Howard 2014)  
       b. John bought the largest [possible for him to buy] present. (Romero 2013)

Howard (2014) defends this hypothesis for cases in which a superlative seems to be modified by a relative clause matching the matrix clause and including a negative polarity item (NPI) as in (7)a. As Howard shows (see further details in section 2.2.4), standard theories of NPI licensing cannot explain why *ever* can be licensed here given that (7)a exhibits a relative reading; current theories can only explain why superlatives license NPIs in their scope under absolute readings (see von Stechow 1999, Herdan & Sharvit 2006, Gajewski 2010). To solve the problem, he argues that the embedded clause is in fact a superlative degree clause (specifying *-est*'s domain of comparison), which, like a comparative clause, can license NPIs.

Romero (2013) independently supports a similar hypothesis to account for modal superlative readings such as (7)b (i.e. John bought as large as possible a present for him to buy). To compositionally derive the specificity of this reading (John bought an actual present) as compared to readings involving *possible* as a noun modifier (a possible present need not be an actual present), she hypothesizes that *possible* is part of the domain of comparison C where it is complemented by a reduced amount relative. In short, she motivates the existence of partially elided superlative clauses (i.e. *possible for him to buy* in (7)b).

In sum, this brief review of the main analyses of the comparandum in comparative and superlative (English) constructions reveals that what is taken to be the most common case in comparative constructions in English-like languages – namely the case in which the comparandum is expressed by a degree clause – is considered to be (at best) exceptional in superlative constructions. Conversely, what remains (at best) controversial for English comparative constructions – namely the case in which the comparandum is of an individual type – is routinely treated as the standard case in superlative constructions. The many (morphosyntactic and semantic) parallels between comparative and superlative constructions

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<sup>3</sup> In English, two-place *-er* is more standardly accepted than three-place *-er* (in other words, the reduced clause analysis in (3)a is more accepted than the direct analysis in (3)b) because of various syntactic and semantic arguments, esp. disjoint reference effects discussed in Lechner (2001, 2004) and Bhatt & Takahashi (2007, 2011); they are illustrated in (iii) where only the reduced clause analysis with 2-place *-er* correctly predicts a Condition C violation. However, note that the facts are different in other languages such as Hindi-Urdu, which leads Bhatt & Takahashi (2007, 2011) to argue that the direct analysis based on 3-place *-er* is used in Hindi-Urdu (vs. English).

(iii) \*More people introduced him<sub>i</sub> to Sally than to Peter<sub>j</sub>'s sister.

beg the question whether this assumed asymmetry is warranted. There are certainly notable differences between comparative and superlative constructions. In particular, comparatives semantically establish a comparison between two *distinct* elements (the correlate and the standard of comparison) while superlatives establish a comparison *within* a set of elements (the domain of comparison *containing* the correlate) as emphasized by e.g. Gawron (1995) or Loccioni (2019). Furthermore, the domain of comparison seems more commonly implicit in superlatives than in comparatives as noted by e.g. Heim (1985). But it is not clear why these differences would derive from the assumed degree/clause vs. individual/phrase type of asymmetry, and to my knowledge, no argument has been provided to that effect; arguments for the analyses of comparanda in comparative and superlative constructions are usually made independently.

The overarching research program underlying the present article is to instead test the default hypothesis that the comparandum should be of the same nature in comparative and superlative constructions (cf. Gawron 1995). The specific goal will be more modest and consist in motivating the existence of superlative clauses in more constructions than previously proposed. Specifically, we will focus on two empirical cases involving superlatives and intensional predicates, namely so-called ‘intensional superlatives’ (Bhatt & Sharvit 2005) as in (8)a and ‘upstairs *de dicto* readings’ (Sharvit & Stateva 2002) as in (8)b, which remain poorly understood.

- (8) a. the longest book that John said that Tolstoy had written (Bhatt 2002)  
 b. John wanted to climb the highest mountain. (Heim 1995/1999)

As we will see, both cases present a reading that cannot be derived by standard theories of superlatives. These two puzzles are usually examined separately, and the various solutions that have been proposed for each do not usually extend to the other (see Bumford & Sharvit 2022 for a recent case). Instead, I will hypothesize that the two problems can be given the same solution because they are of the same nature: both cases require the intensional predicate (e.g. *said*, *wanted*) to scope between the superlative morpheme (*-est*) and the gradable predicate (e.g. *long*, *high*) as suggested by Sharvit (2003) and Hulsey & Sauerland (2006) for intensional superlatives and proposed by Heim (1995/1999) for upstairs *de dicto* readings. Such split scope can be uniformly achieved in both cases under the hypothesis that they involve (elided) superlative clauses as roughly represented in (9), where the bracketed clauses stand for such clausal complements of *-est* and crossed out elements for implicit elements.

- (9) a. the long-est book [~~and~~ John said Tolstoy had written d-long book]  
 b. John wanted to climb the high-est mountain [~~and anyone wanted to climb d-high mountain]~~

The outline of the rest of the article is as follows. Section 2 will concentrate on intensional superlatives like (9)a. We will review the problems raised by the so-called low reading and discuss the main solutions that have been proposed as well as their shortcomings. This will lead us to show that the superlative clause hypothesis provides a novel solution that overcomes the problems of existing approaches. Section 3 will focus on upstairs *de dicto* readings like (9)b. Although the specifics of the argumentation will be different, we will similarly see that assuming the existence of (elided) superlative clauses allows us to improve on previous analyses. Space limitations will only allow us to examine these two cases in detail, but in

Section 4, we will conclude by briefly tackling other issues raised by the superlative clause hypothesis and outlining directions to take in future research to make a full case.

## 2. Intensional superlatives

Intensional superlatives (as dubbed by Bhatt & Sharvit 2005) are superlative adjectives such as *longest* in (10) (repeating (8)a) that seem to modify the head of a relative clause containing an intensional predicate such as *said* in (10).

- (10) the longest book [that John said that Tolstoy had written] (Bhatt 2002: 57)  
a. *longest* > *said* (high reading: longest according to the speaker)  
b. *said* > *longest* (low reading: longest according to John)

As first observed by Bhatt (2002), (10) seems to exhibit two readings depending on who is understood as evaluating the length of the book – John or the speaker. In the latter case (i.e. (10)a), John only expresses an opinion about the authorship of the book. Under this interpretation, (10) may for instance denote *War and Peace* if the speaker and John are not mistaken about book length and book authorship, respectively. This reading is called the high reading because the superlative adjective *longest* seems to be interpreted above the intensional predicate *said*. In the former case (i.e. (10)b), John further expresses an opinion about the length of the book, which is reported by the (possibly disagreeing) speaker. Under this construal, (10) may for example refer to *Anna Karenina* if John is mistaken about book length, but not about book authorship. This reading is called the low reading because *longest* seems to be interpreted below *said*.

According to Bhatt (2002), these two readings reveal two scopal possibilities, which provide a new argument for the raising analysis of relative clauses. Specifically, he argues that the low reading derives from reconstruction of the superlative adjective within the relative clause. Under the low reading, *longest book* in (10) must be interpreted within the relative clause, just like the part of the idiom *headway* in (11). This is only possible, so the argument goes, if the head of the relative clause originates internal to the relative clause.

- (11) The headway that we made was satisfactory.

As we will see in Section 2.1, Bhatt's reconstruction hypothesis remains debated because it faces several challenges; but alternative existing hypotheses are not without their problems either. In Section 2.2, we will see that the superlative clause hypothesis provides a novel solution that reconciles both sides of the debate. The core idea consists in treating the bracketed clause in (10) under the low reading as a superlative clause, which parallels the comparative clause in (12).

- (12) a longer book [than John said that Tolstoy had written ~~a long book~~ (in 1867)]

This hypothesis entails split scope of the superlative morpheme *-est*, which, like *-er*, is interpreted outside the clause, and the gradable predicate *long*, which is interpreted within the clause (see (9)a). Such split scope, I will argue, is the key to reconciling the arguments for and against the reconstruction hypothesis.

## 2.1. The debate on superlative reconstruction

The controversy about Bhatt’s reconstruction hypothesis is based on four main points previewed in Table 2, which we discuss in turn in Sections 2.1.1, 2.1.2, 2.1.3 and 2.1.4, respectively.

	<b>For reconstruction</b> (Bhatt 2002, Bhatt & Sharvit 2005, Hulse & Sauerland 2006, i.a.)	<b>Against reconstruction</b> (Sharvit 2003, Heycock 2005, Heycock 2019, i.a.)
NPI licensing	Local licenser required for low NPI	Intervention effect for low NPI
Intervention effects	Due to A-bar movement	Due to neg-raising
Other modifiers	<i>De dicto</i> reading of other modifiers	Special properties of <i>de dicto</i> readings of other modifiers
Interpretation	<i>De dicto</i> reading of superlative	Overgeneration

Table 2 – The main points of the debate on intensional superlative reconstruction

### 2.1.1. NPI licensing

Bhatt (2002) argues that the constraints on NPI licensing in the clause modifying intensional superlatives support the reconstruction hypothesis. Specifically, he claims that in the presence of a NPI, the type of reading available depends on the position in which the NPI appears as illustrated in (13).

- (13) a. the longest book that John ever said that Tolstoy had written (Bhatt 2002: 60)  
b. the longest book that John said that Tolstoy had ever written

According to Bhatt (2002), (13)a involving *ever* in the higher clause only exhibits the high reading, and (13)b involving *ever* in the lower clause only exhibits the low reading. This correlation, he claims, derives from locality constraints on NPI licensing (cf. Linebarger 1980): the superlative *longest* can only license the NPI *ever* if it is interpreted within the same clause as *ever*; in (13)b, this can only obtain under reconstruction.

But as pointed out by Heycock (2005), the assumption on which Bhatt’s argument relies is incorrect: weak NPIs like *ever* do not require a clausemate licenser. As noted by Bhatt himself (2002: 60, fn. 9), the negation can for instance license a NPI across clauses as shown in (14).

- (14) Mary didn’t say that Mina had ever been to Boston. (Bhatt 2002: 60, fn. 9)

Crucially, Heycock (2005) demonstrates that the same holds of superlatives by using noun complement clauses as in (15) instead of relative clauses as in (13) to circumvent the possibility of reconstruction.

- (15) a. This is the best indication that he was ever here. (Heycock 2005: 375)  
b. This was the first indication that they thought she would ever succeed.

Therefore, sentences like (13)b do not constitute evidence for reconstruction, after all.

Bhatt & Sharvit (2005), however, offer another explanation for the non-ambiguity of (13)b that supports reconstruction. This explanation relies on Kadmon & Landman’s (1993) pragmatic theory of NPI licensing, according to which the role of a NPI is to widen the domain restriction of the indefinite it combines with and the NPI is licensed only when it yields a stronger statement. Thus, *ever* in (13) can only be licensed in contexts where it is not established that the time stretch concerning Tolstoy’s writing exhaustively covers his productive years. This is

possible in (13)b with low *ever*, Bhatt & Sharvit argue, only if *longest book* is in the scope of *said* (i.e. if it has reconstructed); in that case, *ever* is licensed if it is not already established that John believes the time stretch concerning Tolstoy's writing to exhaustively cover his productive years as a book writer. However, if *longest book* is not interpreted below *said*, strengthening only obtains if according to John, the time stretch does not necessarily cover Tolstoy's productive years as a writer of things that are in fact books – a hard constraint for speakers to place on the context, which Bhatt & Sharvit claim accounts for the unavailability of this reading. On Bhatt & Sharvit's account, the absence of the low reading in (13)a with high *ever* also derives from reconstruction of *longest book*: high *ever* cannot be licensed by *longest book* from the reconstructed position below *said* where *longest book* must be interpreted to trigger the low reading, since *ever* would no longer be in the scope of *longest*.

But as discussed in Heycock (2019: 94), this hypothesis predicts a correlation between the low reading and binding conditions, which is not borne out. In particular, intensional superlatives involving a low NPI should be ungrammatical if they contain material that would induce a Condition C violation in the reconstructed position as is the case in (16)a.

(16) a. This is the best picture of Moss<sub>i</sub> that she<sub>i</sub> thought she would ever see.

b. This is the best picture of Moss<sub>i</sub> that she<sub>i</sub> ever thought she would see.

(Heycock 2019: 94)

But in fact, Heycock observes no contrast between (16)a and (16)b where high *ever* is predicted to be incompatible with reconstruction.

Perhaps even more problematically for Bhatt's account, Heycock (2005) shows that intervention effects for NPI licensing provide direct evidence against reconstruction.

(17) a. \*I didn't think that everyone had ever been there.

b. \*This is the longest book that everyone thinks John has ever read.

(Heycock 2005: 376)

Universal quantifiers like *everyone* are known to intervene for NPI licensing as illustrated in (17)a involving a negation as licenser. Crucially, the same intervention effect arises with intensional superlatives as in (17)b. But *everyone* could not intervene if *longest* had reconstructed below *thinks* as hypothesized by Bhatt. In the end, the NPI facts thus seem to argue against Bhatt's reconstruction account.

### 2.1.2. Intervention effects

Given such evidence against reconstruction, Heycock (2005, 2019) proposes an alternative account on the basis of another type of intervention effects: as illustrated in (18), the low reading is blocked by intervening elements such as negation in (a) (or negative verbs, as already noticed by Bhatt 2002: 62), adverbs like *mistakenly* in (b), or various predicates including implicatives like *manage*, weak and strong (vs. midscalar) deontic or epistemic operators like *need* or *be possible*, or factives like *know* in (c).

(18) a. # the longest book that John didn't say that Tolstoy had written.

b. # the longest book that John mistakenly thought that Tolstoy had written

c. # the longest book that John knows that Tolstoy had written



According to Heycock, these facts can be characterized by the following generalization: all and only neg-raising predicates support the low reading; elements such as *mistakenly* or *know* that block neg-raising also block the low reading. She proposes to derive this generalization from the negative entailment that she assumes superlatives generate (cf. Giannakidou 1997).

- (19) a. *Anna Karenina* is the longest book that Jennifer thinks Tolstoy wrote  
 b.  $\neg$  [Jennifer thinks Tolstoy wrote a book other than *Anna Karenina* d long]  
 c. Jennifer thinks  $\neg$  [Tolstoy wrote a book other than *Anna Karenina* d long]  
 (Heycock 2005: 369)

Due to the meaning of the superlative *longest*, sentence (19)a is assumed to generate the negative entailment in (19)b, which is compatible with the high reading. Assuming a semantic (vs. syntactic) analysis of neg-raising, Heycock further hypothesizes that due to the neg-raising property of *think*, the negation can be interpreted lower as in (19)c, thus triggering the low reading. That's why low readings are unavailable with predicates disallowing neg-raising. For instance, (20)a only gives rise to the entailment in (20)b because *know* disallows neg-raising as in (20)c.

- (20) a. *War and Peace* is the longest book that Jennifer knows Tolstoy wrote  
 b.  $\neg$  [Jennifer knows Tolstoy wrote a book other than *War and Peace* d long]  
 c. \*Jennifer knows  $\neg$  [Tolstoy wrote a book other than *War and Peace* d long]

Incidentally, Heycock shows that this hypothesis also provides an explanation for the absence of low readings with high NPIs as in (13)b above: like other adverbs, *ever* blocks neg-raising, and thus the low reading.

Heycock (2005, 2019) does not fully spell out her account. In particular, she does not detail the analysis of neg-raising (cf. Horn 1989 in Heycock 2005, Gajewski 2005 in Heycock 2019) or the negative semantics of superlatives (cf. Giannakidou 1997) she adopts. As suggested by Bhatt & Sharvit (2005), her account can be specified using Heim's (2000) semantics of neg-raising verb (cf. Hulsey & Sauerland 2006) and Heim's (1995/1999) semantics of superlatives (see section 2.1.4). But even so, several points remain unclear or problematic. For instance, it is not always obvious how the negative entailment can be compatible with the high reading in the case of non neg-raising predicates; for example, (20)b is not straightforwardly consistent with the high reading due to the factivity of *know* (cf. Bhatt & Sharvit 2005: fn. 7). More problematically, the predictions in the case of intervening negation, which are not spelled out, seem incorrect. Following the logic in (18), (21)a should generate the entailment in (21)b, which can either entail (21)c (with neg-lowering of one negation, as seems allowed) or (21)d (without or with double neg-lowering).

- (21) a. *Anna Karenina* is the longest book that Jennifer does not think Tolstoy wrote.  
 b.  $\neg$  [Jennifer does not think Tolstoy wrote a book other than *Anna Karenina* d long]  
 c.  $\neg$  [Jennifer thinks Tolstoy did not write a book other than *Anna Karenina* d long]  
 d. Jennifer thinks Tolstoy wrote a book other than *Anna Karenina* d long

While (21)c, which is a very weak assertion, seems compatible with the high reading, (21)d is problematic: it entails that *Anna Karenina* is not the longest book that Jennifer thinks Tolstoy wrote, which is not an available reading for (21)a. These problems are related to a more general issue regarding the assumed scope of the gradable predicate: since the superlative does not reconstruct, it remains unclear how *d-long* (vs. the negation entailed by the superlative) can be

interpreted in the scope of the intensional verb under Heycock's analysis.<sup>4</sup> In section 2.2, we will in fact see that understanding this point will turn out to be the key to solving the problems of both Bhatt's and Heycock's accounts.

But even if we grant that Heycock's neg-raising account could be specified in a satisfactory way, the main problem, as pointed out by Bhatt & Sharvit (2005), is that the generalization it relies upon seems incorrect. First, Heycock's hypothesis undergenerates because the low reading is in fact available with some predicates blocking neg-raising. This is strikingly the case of *say* included in Bhatt's original examples (e.g. (10)). Heycock, who is aware of the problem, proposes to treat *say* in such cases as an evidential that can be paraphrased as in (22).

(22) This is the longest book that Tolstoy wrote, according to John. (Heycock 2005: 372)

However, Bhatt & Sharvit (2005) object that the correct paraphrase should be (23), where *according to John* unambiguously modifies the embedded clause; but (23) does not allow a low reading.

(23) This is the longest book that, according to John, Tolstoy wrote.

(Bhatt & Sharvit 2005: 71)

Furthermore, Bhatt & Sharvit (2005) argue that this explanation could not carry over to other non neg-raising predicates that can also trigger the low reading, such as *agree*, *be certain* or *hope* as illustrated in (24) (although Heycock 2019: fn.1 questions this claim and begs for more thorough empirical investigations).

(24) The longest book John hopes he will (ever) have to read is *Anna Karenina*.

For instance, (24) is acceptable in a scenario where John mistakenly believes that *Anna Karenina* is longer than *War and Peace*, he knows that he will have to read them both, and hopes that at no time will the set of books he has to read include a book longer than *Anna Karenina* (Bhatt & Sharvit 2005: 70).

Conversely and even more problematically, Bhatt & Sharvit (2005) argue that Heycock's neg-raising account overgenerates because the low reading is unavailable with some neg-raising predicates such as *be likely* or *should*. Heycock (2005: 370) claims that such predicates do trigger the low reading on the basis of examples like (25)a-b involving *only*, which both Bhatt (2002) and Heycock (2005) take to behave like superlatives.

(25) a. This is the only book that it's likely that he wrote.

b. That is the only offence that he should claim to have committed.

As acknowledged by Bhatt & Sharvit (2005) too, (25)a is indeed acceptable in a situation where the likelihood is that he wrote only this book, and (25)b in a situation where the requirements are that he claim to have committed only that offence. But Bhatt & Sharvit (2005: 72) argue that these interpretations can also correspond to high readings given that *only* can take a singleton set as sister. A better test should thus include superlative like *tallest* in (26), which is pragmatically incompatible with a singleton set of comparison.

(26) a. The tallest man Mary is likely to meet is John.

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<sup>4</sup> This issue does not stand out in Heycock's articles because most of her examples illustrating the correlation between low reading and neg-raising predicates include *only* rather than superlatives. (19) nevertheless suffices to raise the issue. See further discussion about the difference between *only* and superlatives in section 2.2.2.

b. The tallest man Mary should meet is John.

Such sentences do not trigger the low reading, according to Bhatt & Sharvit (2005). For example, (26)a is infelicitous in a situation where the likelihood is that Mary meets John and some unspecified shorter men. In this situation, the low reading is predicted to be acceptable, but the high reading infelicitous because there is only one specific man (i.e. John) that Mary is likely to meet.

Thus, the generalization motivating Heycock's neg-raising account seems incorrect, after all. But Bhatt's (2002) analysis does not predict the right generalization either. Observing intervention effects by negation and negative verbs, Bhatt (2002) suggests that they can support the reconstruction hypothesis because some kinds of A-bar movement, such as amount questions, are subject to the negative island effect as illustrated in (27).<sup>5</sup>

(27) a. How many articles does the editor want to have in this volume?

b. How many articles does the editor not want to have in this volume?

(Heycock 2005: 364)

In (27)a, the amount can be interpreted in the scope of *want*, as can be clearly seen in scenarios in which the editor has not considered any particular articles yet. But this low reading is unavailable in the presence of negation as in (27)b. However, Bhatt (2002) acknowledges that it remains unclear why reconstruction of superlative would involve the kind of A-bar movement subject to negative island effects.

In fact, Heycock (2005) shows that other phenomena requiring reconstruction within a relative clause, such as idioms, are not subject to negative island effects as exemplified in (28).

(28) This is the kind of headway that few people can make. (Heycock 2005: 365)

Furthermore, Heycock demonstrates that the low reading of intensional superlatives is blocked in a wider range of environment than those blocking amount quantification. For instance, the adverb *mistakenly* blocks the low reading in (29)a, but not in (29)b.

(29) a. # This is the first book that we mistakenly thought that Antonia had written.

b. How many books did you mistakenly think that Antonia had written?

(Heycock 2005: 367)

Bhatt & Sharvit (2005), however, propose another way to account for intervention effects that is compatible with the reconstruction hypothesis. According to them, the low reading is rejected when it (Strawson-)entails the high reading (ignoring cases involving negation or negative verbs). For instance, they argue that in examples like (20) involving factive *know*, the high reading is necessarily true when the low reading is true.

In sum, both the empirical generalization about the set of interveners for the low reading and the analysis of such intervention effects remain debated. Neither Bhatt's (2002) reconstruction account nor Heycock's neg-raising account seem to make the right predictions for all cases. Strikingly, the case that is provided in both cases as most illustrative of intervention effects, namely negation, ends up being explained by neither analysis.

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<sup>5</sup> Bhatt's (2002) original example to illustrate the point is (iv). But the ambiguity is here unclear since the verb *feed* is not intensional.

(iv) How many dogs did John not feed?

### 2.1.3. Other modifiers

Bhatt (2002) restricts his investigation of low readings to superlative adjectives, ordinals *first* and *last*, and nominal *only*. Nevertheless, his reconstruction account predicts that any modifier should be subject to the same ambiguity since there is no reason why reconstruction would target some modifiers rather than others.

This is precisely one of the further arguments for the reconstruction account provided by Hulsey & Sauerland (2006). They argue that adjectives like *wonderful* in (30) behave like superlatives in their ability to be read *de dicto* (e.g. with respect to the embedded verb *said*).

- (30) The wonderful books that Siouxsie said that Lydia had written  
(Hulsey & Sauerland 2006: 125)

(30) can indeed refer to books judged to be wonderful by Siouxsie, but not by the speaker. Both Bhatt (2002: 73, fn.18) and Heycock (2005: 362) also observe this fact, but consider it as a case different from intensional superlatives because, under this reading, the adjective exhibits a scare quote intonation and does not require any intensional predicate in its sentence as shown in (31).

- (31) Siouxsie was always going on about the books that Lydia had written. But I've read those wonderful books and they are complete rubbish. (Heycock 2005: 362)

Hulsey & Sauerland reply to this objection that the special intonation often used in (30) is due to the fact that scenarios proposed to highlight the *de dicto* reading usually require evaluating *wonderful* and *books* in different worlds. The scare quote intonation is not observed when the noun *books* is forced to be interpreted in the scope of *say* as in (32).

- (32) The wonderful books that Siouxsie said that Lydia had written turned out to be just a bunch of one-page leaflets. (Hulsey & Sauerland 2006: 125)

Furthermore, they show that superlatives can also trigger a *de dicto* reading in the absence of an intensional predicate as in (33).

- (33) 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*. (Hulsey & Sauerland 2006: 125)

But Heycock argues that cases like (33) require a special intonation showing that they should be classified in the same category as (30)-(31). Moreover, she shows that other modifiers than superlatives are not subject to the intervention effects discussed in Section 2.1.2 as illustrated in (34), which displays a *de dicto* reading despite the presence of the intervening negation.

- (34) The expensive car that his wife didn't think he should buy was actually a Ford Mondeo. (Heycock 2005: 363)

Finally, note that in example (32), the absence of special intonation seems to be due to the semantics of the verb *turn out*, which presupposes a different judgment for its subject and its object (cf. Bhatt 2002: fn.18, ex. (iv));<sup>6</sup> and under Hulsey & Sauerland's reasoning, it remains unclear why the noun would be forced to reconstruct with superlatives, but not with other modifiers.

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<sup>6</sup> An anonymous reviewer further notes that there is contrastive intonation between *books* and *leaflets*, which reduces the emphasis on the would-be scare quoted part.

In sum, there are at least three properties that distinguish the *de dicto* reading of other modifiers from that of intensional superlatives, suggesting that this reading is derived in a different way (which is also applicable to superlatives in some cases like (33)). This is unexpected under Bhatt’s reconstruction account, but compatible with Heycock’s neg-raising account, under which only modifiers with a negative entailment can trigger a low reading.

#### 2.1.4. Interpretation

The fourth and last main argument invoked in the debate on the reconstruction of intensional superlatives is their interpretation. As we saw at the outset, the ambiguous interpretation of intensional superlatives in phrases like (35) (repeating (10)) is the very source of the debate: it is because the superlative *longest* seems to be interpretable in the scope of the intensional predicate *said* that Bhatt (2002) hypothesizes that it can reconstruct.

(35) the longest book [that John said that Tolstoy had written]

But as shown by Sharvit (2003), assuming reconstruction of the superlative is problematic under any semantics of the superlative morpheme *-est*. As mentioned in the introduction, one type of lexical entry for *-est* assumes that the domain of comparison is a set of individuals.

(36)  $\llbracket -est \rrbracket (C_{\langle e, t \rangle})(R_{\langle d, et \rangle})(y_e) = 1$  iff  $\exists d \mid R(y)(d)=1$  and  $\forall z \in C \mid z \neq y, R(z)(d)=0$   
 $\llbracket -est \rrbracket$  is defined only if (a)  $y \in C$ ; (b)  $\forall x \in C, \exists d \mid R(x)(d)=1$  (cf. Heim 1995/1999: 3)

In (36), *-est* takes three arguments: an implicit, individual-based domain argument  $C$  contextually determined (e.g. a set of relevant books), a gradable predicate  $R$  (e.g. *long book*, where *long* is a relation between individuals and degrees) and an individual argument  $y$  (e.g. *War and Peace*). Assuming a downward monotonic meaning for gradable adjectives, *War and Peace is the longest book* is true if and only if there is a degree such that *War and Peace* is a book long to that degree, and no other book in the comparison set is long to that degree. If we adopt this lexical entry to derive the low reading of (35) as represented in (37), Sharvit (2003) explains that no value of the comparison set can give rise to the correct interpretation, but (37) both over- and undergenerates.<sup>7</sup>

(37) the 1 John said Tolstoy wrote the est-C long book-1

If  $C$  is construed as a set of relevant books, we should expect a reading under which some of these books can be by other authors than Tolstoy, which is in fact absent. If  $C$  is restricted to a set of relevant books by Tolstoy, (37) implies that John said something like “Tolstoy wrote the longest book that Tolstoy wrote”, which is odd.

The second type of lexical entry for *-est* we evoked in the introduction involves a degree-based comparison set.

(38)  $\llbracket -est \rrbracket (C_{\langle dt, t \rangle})(P_{\langle dt \rangle}) = 1$  iff  $\exists d \mid P(d)=1$  and  $\forall Q \mid C(Q)=1$  and  $Q \neq P, Q(d)=0$   
 $\llbracket -est \rrbracket (C)(P)$  is defined only if  $P \in C, \exists Q \in C \mid Q \neq P$ , and  $\forall P' \in C, \exists d \mid P'(d)=1$

<sup>7</sup> Hulsey & Sauerland (2006: 128, (53e)) propose another representation shown in (v), in which the superlative is interpreted at an intermediate position at the edge of the embedded clause. But as far as I can see, the same problems arise under this representation as well. They also propose a second possible representation discussed later in the main text.

(v)  $\lambda w \dots \text{the } \lambda x \text{ John believes}(w) \lambda w' x -est(C_{w'}) \lambda d [\text{long}(d)(w') \ \& \ \lambda x \text{ Tolstoy wrote the}_x \text{ book}(w')]$

(cf. Heim 1995/1999: 18)

This lexical entry, which requires *-est* movement, takes two arguments: an implicit, focus-based domain argument C consisting of a set of degree properties determined via association with focus (Rooth 1992), and a property of degrees P. Heim (1995/1999) specifically designs it to capture relative readings of superlatives as illustrated in (39) (cf. (6)c).

- (39) a. TOLSTOY wrote the longest book.  
b. *est*-C [[1 [Tolstoy<sub>F</sub> wrote the d<sub>1</sub>-long book]]~C]  
P =  $\lambda d$ . Tolstoy wrote a/the<sup>8</sup> d-long book  
C = { $\lambda d$ . Tolstoy wrote a/the d-long book,  $\lambda d$ . Dostoevsky wrote a/the d-long book,  
 $\lambda d$ . Shakespeare wrote a/the d-long book, ...}. (Sharvit 2003)

The relative reading of (39), which is favored by focusing *Tolstoy*, implies a comparison between book authors. This is derived under (39) by making *-est* focus sensitive: *-est* moves to a propositional level and takes as first (implicit) argument (C) the focus value of its complement P. (39)b thus predicts (39)a to be true if and only if there is a degree such that Tolstoy wrote a book long to that degree, and no other relevant author wrote a book to that degree.

Bhatt (2002) uses this lexical entry to derive the low reading as shown in (40), where *longest* reconstructs in the relative clause, moves to the edge of the embedded clause and focus-associates with the trace of the relative head (or more precisely, with the embedded variable in the lowest copy of the head after trace conversion à la Fox 2002).

- (40) [the  $\lambda x$  John said that *-est*-C [[ $\lambda d$  [Tolstoy wrote (the) d-long book x<sub>F</sub>]]~C]]  
(Bhatt 2002: 65, Sharvit 2003)

This proposal correctly derives the low reading. But as demonstrated by Sharvit (2003), it overgenerates unless it is stipulated that only the variable inside the trace in the scope of *-est* can be focused. In particular, the interpretation under which John said (39) is unavailable even with focus on *Tolstoy* as in (41) (in this case, Tolstoy is contrasted with other individuals as authors mentioned by John, not as authors of the longest book). But Bhatt's derivation predicts it to be available as long as *-est* focus-associates with *Tolstoy* as is the case in (41).

- (41) a. The longest book John said TOLSTOY wrote was *War and Peace*. (cf. Sharvit 2003)  
b. [the 2 John said *est*-C [[1 [Tolstoy<sub>F</sub> wrote a d<sub>1</sub>-long book-2]]~C]]

In sum, the two main lexical entries for *-est* that have been proposed overgenerate interpretations under Bhatt's reconstruction account. In particular, both incorrectly predict the existence of a reading implying a comparison between books by Tolstoy and books by other contextually relevant authors. As for Heycock's neg-raising account, it is not explicit about the detailed derivation of the interpretation as we mentioned above.

To solve the problem, Sharvit (2003) proposes an alternative derivation based on the lexical entry in (36), where *-est* remains interpreted external to the clause while the rest of the relative head reconstructs as represented in (42) (cf. Hulsey & Sauerland 2006: (53)d).

- (42) the *est*-C 2 1 [John said-w 3 Tolstoy had written-w<sub>3</sub> (the) d<sub>2</sub>-long-w<sub>3</sub> book<sub>1</sub>]  
(Sharvit 2003)

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<sup>8</sup> This is Sharvit's 2003 notation. See sections 3.1.2 and 3.2.2 for discussion about the issue of definiteness.

According to (36), (42) refers to the book satisfying the following conditions: there is a degree such that according to John, the book is long to that degree and Tolstoy wrote it; and for all alternative books, it is not the case that according to John, they are long to that degree and Tolstoy wrote them. This derives the correct interpretation only if the following assumption is made: the set of alternative books must be restricted to books that John said Tolstoy wrote, as specified by Sharvit (2003). Furthermore, why split scope of *-est* and *d-long* is licensed under this analysis remains unclear.

Overall, no existing account can thus straightforwardly derive the correct interpretation for the low reading. Whether the whole head or only part of the head is assumed to reconstruct, some stipulations are required to avoid overgeneration (at best).

## 2.2. The superlative clause hypothesis: a novel solution to the problem

This review of the main arguments of the debate has revealed that the various properties of intensional superlatives under the low reading cannot be satisfactorily explained under any existing analysis. To summarize the main outcomes, Bhatt's reconstruction account overgenerates low readings for other modifiers than superlatives, as well as other low (e.g. relative) interpretations of superlatives; furthermore, it does not derive the intervention effects observed for the low reading as well as those for NPI licensing. Heycock's neg-raising account seems to fare better with respect to the NPI facts and the other modifiers; but it both over- and under-generates intervention effects, and it can only precisely derive the interpretation under some stipulations regarding the domain of comparison and the split scope of the superlative.

The superlative clause hypothesis, I propose, can solve the problem. The core idea is to treat the purported relative clause under the low reading as a superlative clause, that is, as a degree clause complementing the superlative morpheme and denoting the domain of comparison, as shown in (43)a. This construction is thus the counterpart of the comparative construction in (43)b.

- (43) a. the longest book [that John said that Tolstoy had (ever) written ~~a long book~~]  
       b. a longer book [than John said that Tolstoy had written ~~a long book~~ (in 1867)]

As we will detail below, this hypothesis straightforwardly incorporates the improvements of the neg-raising account on the reconstruction account. Since it crucially entails that the superlative morpheme *-est* remains external to the clause, it makes the same correct predictions regarding intervention effects for NPI and avoids the overgeneration of other low (e.g. relative) readings. Since it is intrinsically tied to the presence of a superlative, it avoids the overgeneration of low readings for other modifiers than superlatives. Furthermore, it overcomes the problems faced by the neg-raising account. The nature of the superlative clause (a degree clause) suggests a natural explanation for intervention effects that does not suffer over- and undergeneration. Moreover, this proposal motivates the need for split scope (argued for explicitly by Sharvit 2003, and implicitly by Heycock 2006) to derive the correct interpretation without requiring any additional stipulation regarding the domain of comparison, which is explicitly expressed by the clause.

In the next sections we review in turn (going in the reverse order) how each issue is treated under the superlative clause hypothesis as previewed in (44).

- (44) Solutions to the main empirical puzzles under the superlative clause hypothesis:
- *NPI licensing*: NPIs are licensed in superlative clauses and affect the construal of the comparison class;
  - *Intervention effects*: Intervention effects are due to degree quantification;
  - *Other modifiers*: Low readings are restricted to modifiers taking domain-denoting degree clauses;
  - *Interpretation*: Scope of *-est* (outside the clause) and adjective (inside the clause) is split.

### 2.2.1. Interpretation

We saw that the interpretation of intensional superlatives under the low reading gives rise to a conundrum: on the one hand, the superlative (e.g. *longest*) seems to be interpreted in the scope of the intensional predicate (e.g. *said*); on the other hand, interpreting the superlative morpheme *-est* within the embedded clause generates semantic problems. As suggested by Sharvit (2003) (cf. Hulsey & Sauerland 2006) and implied by Heycock's analysis, split scope solves the problem: while the gradable predicate is interpreted within the clause, *-est* is only interpreted outside the clause. But we also saw that under Sharvit's 2003 hypothesis, it remains to motivate such obligatory split scope as well as the obligatory restriction of the domain of comparison. Crucially, the superlative clause hypothesis naturally motivates both points. First, the superlative clause hypothesis does not require stipulating a restriction of the domain of comparison to avoid overgeneration of interpretations where books by Tolstoy are compared to books by other authors: the core feature of this hypothesis is that the clause explicitly expresses the domain of comparison *C*, which is left implicit in previous analyses (whether it is contextually determined by context in (36) or by focus in (38)). In (43)a repeated below, the comparison can thus only concern books by Tolstoy according to John, since the clause explicitly restricts the domain of comparison to those.

- (45) the longest book [**that John said that Tolstoy had written a long book**]

Second, the superlative morpheme *-est* must be interpreted external to the clause since the clause in (46)a is construed as an argument of the superlative morpheme *-est*, just as in (46)b, the comparative clause is an argument of the comparative morpheme *-er*. Note that (46)b shows a simplified representation of the comparative clause under the standard hypothesis that comparative clauses involve abstraction over degrees due to covert operator movement and binding of the degree variable *d* (see e.g. Lechner & Corver 2017, Lechner 2020 for a review).

- (46) a. the longest book [**that  $\lambda d$  John said Tolstoy had (ever) written a ~~d-long~~ book**]  
 b. a longer book [**than  $\lambda d$  John said Tolstoy had written a ~~d-long~~ book (in 1867)**]

As for the gradable predicate *d-long book*, it must be interpreted both in the embedded clause and in the matrix clause as is the case in comparative clauses (however this is derived<sup>9</sup>). The

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<sup>9</sup> The mechanism for recovering the adjective (*long*) and the noun (*book*) in the comparative clause is debated. In predicative comparative constructions, which have been more extensively discussed, the adjective is often assumed to be recovered by ellipsis (comparative deletion as in e.g. Kennedy 2002) or sometimes by movement (head raising as in e.g. Lechner 2004). The few analyses of attributive comparative constructions (e.g. Kennedy & Merchant 2000, Lechner 2004) also assume movement or/and ellipsis of the adjective and the noun under some additional assumptions about the structure that cannot be detailed here.



superlative clause hypothesis therefore entails split scope of *-est* and *d-long*, thus overcoming the aforementioned problems of scoping *-est* within the clause.

More specifically, we mentioned in the introduction that most analyses of comparative clauses agree on treating them as degree clauses complementing a 2-place degree-based comparative morpheme. Our hypothesis can thus be implemented by treating clausal superlatives in a parallel fashion by adopting the treatment of *-est* in (38) (repeated below in (47)) as a 2-place degree-based superlative morpheme, as proposed by Howard (2014) (cf. Romero 2013 – the only two previous proponents of the superlative clause hypothesis).

- (47)  $\llbracket -est \rrbracket (C_{\langle \langle d, s \rangle, t \rangle})(P_{\langle d, s \rangle}) = 1$  iff  $\exists d \mid P(d)=1$  and  $\forall Q \mid C(Q)=1$  and  $Q \neq P$ ,  $Q(d)=0$   
 $\llbracket -est \rrbracket (C)(P)$  is defined only if  $P \in C$ ,  $\exists Q \in C \mid Q \neq P$ , and  $\forall P' \in C$ ,  $\exists d \mid P'(d)=1$   
 (cf. Heim 1995/1999: 18)

Under this hypothesis, the superlative clause explicitly expresses the domain of comparison *C* (a set of degree properties<sup>10</sup>), which was originally conceived under this hypothesis as corresponding to the implicit focus value of *P*. This is illustrated in (48) based on Howard's 2014 example and representations.

- (48) a. Mary sang the loudest **she has ever sung at eleven am**.  
 b.  $\llbracket est \rrbracket [\text{she has ever sung } \textbf{d-loud}] \llbracket \text{Mary sang d-loud} \rrbracket$   
 c.  $est(\{\lambda d. \lambda w. \text{Mary sing d-loud at } t \text{ in } w \mid t \in D_i\})(\lambda d. \lambda w. \text{Mary sing d-loud at } 11 \text{ am in } w)$   
 (cf. Howard 2014)

As we can see in (48)c, the superlative clause here corresponds to the first argument of *-est* (after *-est* covert movement to the propositional level) and denotes the set of degree properties – varying along the dimension of singing times – such that Mary sung to those degrees. It is similar to the comparative clause in (49).

- (49) a. Mary sang louder at eleven am **than (she sang) at ten am**.  
 b.  $\llbracket er \rrbracket [\text{she sang } \textbf{d-loud at ten am}] \llbracket \text{Mary sang d-loud} \rrbracket$   
 c.  $er(\lambda d. \lambda w. \text{Mary sing d-loud at ten am in } w)(\lambda d. \lambda w. \text{Mary sing d-loud at } 11 \text{ am in } w)$

The two main differences between the superlative and the comparative clauses are as follows. First, the comparative clause denotes a set of degrees,<sup>11</sup> while the superlative clause seems to denote a set of such sets (or more specifically, intensions thereof) as we will further discuss in section 2.2.4: while *-er* relates two elements, *-est* makes a universal claim (see Heim 1985, 1995/1999). Second, as observed by Howard, mismatches between the matrix and the

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Note that another important topic for debate in the comparative literature, which won't be addressed here either, is the way the adjective, the noun and the comparative clause combine (see review in e.g. Lechner & Corver 2017, Lechner 2020). Heimian analyses, which underlie most hypotheses mentioned in the main text, rely on the hypothesis that the comparative morpheme forms a constituent with the comparative clause.

<sup>10</sup> Following Heim (1995/1999), Howard (2014) does not treat *C* as a set of degree sets (like Romero 2013), but as a set of intensions thereof, i.e. a set of degree properties, because of cases involving ties. For instance, Howard (2014: 24) claims that *Mary sung the loudest* is not judged true if Mary and Lee sang at exactly the same intensity; this is only captured under the degree properties hypothesis: under the degree sets hypothesis, the set of degrees such that Mary sung to those degrees is indistinguishable from the set of degrees such that Lee sung to those degrees. Conversely, Romero (2013) adopts degree sets because modal superlatives allow, in fact require, the possibility of ties between possible worlds: *Mary is the prettiest possible* does not preclude Mary to be as pretty in some possible worlds as she is in the actual world (see discussion in Loccioni 2018: 86-87).

<sup>11</sup> Under the Heimian approach discussed here, the comparative is thus analyzed as a generalized quantifier of degrees (Heim 2000, i.a.). Under an alternative approach (Rullmann 1995, i.a.), this set is nominalized through maximization (see e.g. Lechner 2000 for a review).

superlative clauses seem to be impossible while this is routinely attested in comparatives as exemplified in (50).

- (50) a. Bill wrote the most poems that anyone ever {wrote/\*published}. (Howard 2014: 13)  
 b. Bill wrote more poems than Paul ever {did/published}.

According to Howard (2014), these mismatch effects in superlative clauses derive from the definiteness condition in (47) ( $P \in C$ ). Due to the definition of focus values (e.g. in Rooth 1992), this condition is necessarily satisfied (and thus redundant<sup>12</sup>) under the original hypothesis where  $C$  corresponds to the focus value of  $P$ . Under Howard's hypothesis that  $C$  can be explicitly expressed by a superlative clause, this condition entails a match between the matrix clause and the superlative clause.

This matching condition raises a question for applying Howard's hypothesis to our intensional superlatives, where the matrix clause does not match the subordinate clause. If the subordinate clause corresponds to the domain of comparison under our hypothesis, what exactly then is the clause containing the correlate in our cases (i.e. the counterpart of the matrix clause in Howard's cases, e.g. in (48): *Mary sung the loudest at eleven am*, i.e.  $\lambda d. \lambda w. \text{Mary sing } d\text{-loud at } 11\text{am in } w$ )? It can't be the overt matrix clause which need not involve an intensional predicate as in (51):

- (51) *Anna Karenina* is the longest book John said Tolstoy wrote.

Under the low reading, we clearly don't want to compare the *actual* length of *Anna Karenina* with the lengths John attributes to Tolstoy's books: the correlate also needs to be relativized to John's opinion. Furthermore, doing so would violate the definiteness condition of superlatives, which requires the correlate to belong to the set of comparison (partitive presupposition  $P \in C$ ). For these reasons, I propose that the clause containing the correlate is elided, thus matching the superlative clause (given identity conditions on ellipsis) as shown in (52)<sup>13</sup> (cf. Bassi 2021)<sup>14</sup>.

<sup>12</sup> According to Howard (2014) based on Heim (p.c.), there are nevertheless cases such as (vi) that independently justify specifying this condition in the lexical entry of *est*.

(vi) All the sopranos that auditioned were impressive. But Mary sang the LOUDest at 11am.

Here, the inference about Mary being a soprano is presuppositional and cannot derive from focus.

<sup>13</sup> Interestingly, some languages like French can double the article in superlative constructions and thus more easily license a construction with two identical overt subordinate clauses as in e.g. *le livre que Jean a dit que Tolstoy avait écrit le plus long que Jean ait dit que Tolstoy ait écrit*. (lit. 'the book that John said that Tolstoy had written the longest that John said that Tolstoy had written'). As mentioned by an anonymous reviewer, the elided clause cannot however be overtly expressed in such constructions in English: for example, *the longest book that Tolstoy wrote that Tolstoy wrote* is interpreted as a redundant stacked relative clause. Although the exact reason for this remains unclear, note that this is reminiscent of obligatory deletion in comparative clauses under maximal identity (e.g. *\*Pico's novel is more interesting than Brio's novel is interesting* in Kennedy & Merchant 1999: 96). Further note that just as in the case of comparative clauses (see e.g. Kennedy 2002), the elided clause cannot be identical to a previous clause (e.g. *Tolstoy wrote a 1000-long book. John read a longer book than Peter (\*wrote)*); in the case of superlatives, this would anyway violate the partitive condition.

Conversely, the partitive presupposition of superlatives – defined as the degree property  $P$  belonging to the set of degree properties  $Q$  – correctly predicts that as observed by the same reviewer, the correlate cannot be expressed by an overt clause distinct from the superlative clause: for example, *Ulysse is the longest book Tolstoy wrote that John read* is infelicitous in a scenario where *Ulysse* is the longest book John read and the longest book Tolstoy wrote is the same length as *Ulysse*.

<sup>14</sup> For independent reasons related to indexical binding, Bassi (2021: 136) similarly proposes that subordinate clauses combining with *only* can be duplicated, with one being elided under identity (e.g. *I am the only one ~~who submitted x's paper~~ who submitted x's paper*).

- (52) a. the longest book John said Tolstoy wrote ~~John said Tolstoy wrote~~  
 b. the  $\lambda x$  [-est [ $\lambda d$  John said that Tolstoy wrote ~~d-long book x~~] [ $\lambda d$  John said that Tolstoy wrote ~~d-long book x~~]  
 c. -est ( $\{\lambda d. \text{John said Tolstoy wrote a } d\text{-long book}\})(\lambda d. \text{John said Tolstoy wrote a } d\text{-long book})$

Assuming that the head of the superlative clause reconstructs, (52) thus refers to the book<sup>15</sup> satisfying the following conditions: there is a degree such that according to John, the book is long to that degree and Tolstoy wrote it; and for all alternative books, it is not the case that according to John, they are long to that degree and Tolstoy wrote them. This derives the correct interpretation.

It remains to specify how the superlative clause can denote a set of degree properties while the elided clause denotes a degree property as required by the partitive presupposition of superlatives (see further discussion in section 2.2.4). I hypothesize that this can here derive from focus on the trace  $x$  of the head (cf. Bhatt 2006), while the trace in the elided clause is not focused. Note that unlike Bhatt's proposal, focus association does not overgenerate readings due to constraints on elision under identity (for example, focus on *Tolstoy* cannot here generate a reading involving other authors, as *Tolstoy* must be copied under identity in the elided clause). In sum, instead of building the domain of comparison  $C$  based on context or focus alone, which we saw overgenerates readings and does not account for the specific properties of intensional superlatives, we have built it in the syntactic representation as is the case in comparative constructions. Moreover, the ellipsis process we hypothesize, which we independently know is subject to identity conditions, guarantees that the partitive nature of superlatives is satisfied: unlike comparatives that relate two distinct elements, superlatives relate a set and an element belonging to that set.

As mentioned in previous sections, this proposal bears some resemblance to one of the hypotheses discussed by Hulsey & Sauerland (2006: 128) and Sharvit (2003, 2007), who consider a LF for intensional superlatives that involves split scope of (3-place) *-est* and gradable predicates, although they do not treat these cases as comparable to degree clauses in comparative constructions (under their hypotheses, these clauses remain relative clauses with partial reconstruction and the domain of comparison is contextually determined).

- (53) a.  $\lambda w \dots$  the  $-\text{est}(C) \lambda d \lambda x$  John believes( $w$ )  $\lambda w' x$  [ $\text{long}(d)(w')$  &  $\lambda x$  Tolstoy wrote the <sub>$x$</sub>  book( $w'$ )] is *Anna Karenina* (cf. Hulsey & Sauerland 2006: 128)  
 b. [the 1 est- $e_1$  [5 6 John believes Tolstoy wrote a  $d_5$ -long book  $e_6$ ]] is *Anna Karenina* (cf. Sharvit 2007: 337)

Both Hulsey & Sauerland (2006) and Sharvit (2007) discuss a potential problem for such LFs that seems to extend to our proposal. Consider a scenario where John is sure that *Anna Karenina* is 1000 pages but is unsure whether *War & Peace* is 500 pages or 1500 pages (and he is sure that all other Tolstoy's books are shorter). In this case, (53) is wrongly predicted to be true because

<sup>15</sup> I here assume that the head *book* can be interpreted both within and outside the clause, in which case the speaker and John agree that it is a book, but nothing here hinges on this hypothesis. What matters is that *book* is interpreted at least low, *-est* is interpreted only high, and *d-long* only low. See e.g. Sportiche (2016) for reconstruction effects and their derivation in relative clauses. Further note that I do not here detail the syntactic structure, esp. the highly debated structure of the degree head projection (see fn. 9).

there are some worlds compatible with John's beliefs where *War and Peace* is not 1000 pages long while *Anna Karenina* is 1000 pages long in all these worlds. But as observed by Hulsey & Sauerland (2006), this problem is solved if we treat the intensional verb as including a uniformity presupposition as proposed by Heim (2000):

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

This implies that when we assert that  $x$  believes  $P$ , we presuppose that  $x$ 's beliefs are determinate, i.e.  $x$  either believes  $P$  or believes not- $P$ . Therefore, *John believes that Anna Karenina is d-long* is undefined for degrees between 500 and 1500, and (53) is correctly predicted to be a presupposition failure in the aforementioned scenario.

Now this kind of uniformity presupposition is usually assumed to be specific to neg-raising verb and as discussed in section 2.1.2, the low reading is also available with some non neg-raising verbs such as *say* or *agree*. This leads Sharvit (2007) (unlike Sharvit 2003)<sup>16</sup> to reject this LF. But although the verb *say* is syntactically not neg-raising, the semantics of *say* is less understood than the semantics of *believe* as mentioned by Hulsey & Sauerland (2006); in fact, it seems reasonable to assume that verbs like *say* or *agree* include the verb *believe* in their semantics (roughly *say* = *believe* + *utter*) when they take sentient subjects (cf. Anand, Grimshaw & Hacquard 2017, Demirok, Ozyıldız & Oztürk 2019, Major & Stockwell 2021, i.a.).<sup>17</sup> Under this assumption, the same presupposition failures ensue with those verbs under similar scenarios (i.e. if John says: “*Anna Karenina* is 1000 pages but I don't know whether *War & Peace* is 500 pages or 1500 pages”, I cannot truthfully report this as *Anna Karenina is the longest book John said Tolstoy wrote*).

Furthermore, Sharvit (2007) mentions a second problem related to, but different from the problem just discussed: (53) is perfectly felicitous even if John does not have any opinion about the specific lengths of Tolstoy's books but only has a comparative belief, i.e. if he believes the following: “*Anna Karenina* is the longest book Tolstoy wrote but I have no idea how long it is.”<sup>18</sup> Again, the problem can be solved by assuming a uniformity presupposition for intensional predicates. Under the above scenario and our proposal, John's beliefs are expressed as in (55)a and (53) as in (55)b.

- (55) a. [John believes:]  $\exists d \mid \text{Anna Karenina is } d\text{-long and other books by Tolstoy are not } d\text{-long.}$   
 b.  $\exists d \mid \text{John believes that Anna Karenina is } d\text{-long and John does not believe that other books by Tolstoy are } d\text{-long}$

<sup>16</sup> Sharvit (2007) is the published version of Sharvit's (2003) handout, where she presents a different final analysis: while Sharvit (2003) argues for split scope, Sharvit (2007) argues for reconstruction of *-est* (like Hulsey & Sauerland 2006: (53)e, see fn. 7) mainly due to the problem discussed here. As such, she nevertheless inherits most of the problems of reconstruction accounts, and furthermore relies on Hulsey & Sauerland's assumptions that the adjective *long* can be interpreted in an intermediate position on the edge of the finite CP, and that *-est* can be interpreted between the  $\lambda$ -operator and this intermediate trace.

<sup>17</sup> A precise examination of the semantics of *say* would lead me too far afield, but note that promisingly, the low reading seems to require a square intonation (which signals that this is not an actual low reading involving a superlative clause, see sections 2.1.3 and 2.2.2) when an inanimate subject forces a non doxastic interpretation and only a comparative (vs. quantitative) judgment is expressed as in (vii).

(vii) The sign says: here is the best restaurant you will find in town!

Paul says: Ok, Let's go to the best restaurant that the sign says we will find in town.

<sup>18</sup> Conversely, proposals like Bhatt (2006) scoping *-est* within the clause do however predict the low reading to be available even when John only expresses explicit opinions about lengths (but no explicit comparative judgment) provided that John is rational and consistent.

Given the uniformity presupposition of *believe*, (55)a and (55)b are equivalent and our proposal thus correctly predicts (53) to be true under the above scenario.

Assuming a uniformity presupposition for non neg-raising verbs like *say* or *agree* that incorporate the notion of belief can similarly solve the problem. Alternatively, note that Sharvit (2007: fn. 10) suggests that this extensionality problem can be solved by adopting an intensionalized version of *-est*.<sup>19</sup>

### 2.2.2. Other modifiers

Moreover, the superlative clause hypothesis straightforwardly solves the problematic point concerning other modifiers. Recall that Heycock (2005) shows that the *de dicto* readings of superlatives and other modifiers do not exhibit the same properties, leading her to conclude that they are not derived in the same way. This undermines Bhatt's reconstruction account and supports her neg-raising account according to which only modifiers generating a negative entailment are predicted to give rise to low readings.

The predictions of the superlative clause hypothesis are similar to Heycock's hypothesis: it correctly predicts that only a specific class of modifiers can trigger the low reading (i.e. the *de dicto* reading associated with neutral intonation, obligatory intensional predicate and intervention effects). Specifically, only modifiers compatible with superlative clauses (vs. modifiers generating a negative entailment under Heycock's analysis) are predicted to give rise to the low reading. This straightforwardly makes the correct predictions for our main cases involving superlative adjectives like *longest*.

What about the other cases discussed by Bhatt (2002) and Heycock (2005)? Even if they disagree on the analysis, Bhatt (2002) and Heycock (2005) agree on including not only superlatives like *longest*, but also nominal *only*, ordinals like *first* and numeral-like modifiers like *few* in the descriptive class of intensional superlatives (i.e. modifiers yielding a low reading), and on excluding evaluative adjectives from it; Heycock (2005) further shows that all adjectives (e.g. *expensive* in (34)) behave like evaluative adjectives in this respect.

- (56) a. the longest book John said Tolstoy wrote.  
 b. the only book John said Tolstoy wrote.  
 c. the first book John said Tolstoy wrote.  
 d. the few books John said Tolstoy wrote.  
 e. #the wonderful books John said Tolstoy wrote.  
 d. #the expensive books John said Tolstoy wrote.

But Bhatt and Heycock disagree on the empirical details, i.e. on how to characterize the low reading in some cases and what elements to include from the class of ordinals and numerals. Regarding ordinals, Bhatt explicitly mentions only *first*, and distinguishes the low and the high readings (in e.g. (56)c) based on whether the ordering implied by *first* is determined by the low verb or the high verb: the low reading of (56)c can be paraphrased as the book John said Tolstoy wrote first (where the order of writing matters), and the high reading as the book John first said

<sup>19</sup> In a previous, unpublished version of Sharvit (2007) closer to Sharvit (2003), Sharvit makes a concrete proposal for intensionalized 3-place *-est*. Note that following Howard (2014), we have also intensionalized 2-place *-est*, for independent reasons, namely partitivity and cases of ties (see fn. 12).

Tolstoy wrote (where the order of saying matters). But Heycock demonstrates based on the case of *second* in (57) that the type of ordering and the rank induced by ordinals are not always evaluated with respect to the same element.

(57) The second mammal that we know emerged from the water. (Heycock 2005: 379)

Under the most salient reading of (57), it is the order of emerging (vs. order of knowing) that matters. Nevertheless, (57) cannot be paraphrased as the mammal that we know emerged second from the water: the rank (second) should not be interpreted in the scope of *know*, even if the type of ordering is determined by the embedded verb *emerge*.

As for numerals, Bhatt includes in intensional superlatives both standard numerals like *two* and numeral-like modifiers like *many* or *few* when they occur with the definite determiner. But Heycock questions the claim that standard numerals like *two* in (58) exhibit a low reading.

(58) a. The two books that John said that Tolstoy had finished.

b. Two books that John said that Tolstoy had finished.

According to Heycock, the difference between (58)a (which is supposed to exhibit the low reading) and (58)b (which is supposed not to exhibit it) should not be described in terms of scope with respect to *said*, but in terms of familiarity and salience (required by *the*): (58)a favors the reading under which the number of books was specified by John because such mention by John makes this number of books familiar and salient, thus favoring the presence of *the*.

As shown by Heycock, the cases of ordinals and numerals thus further argue against Bhatt's reconstruction account: reconstructing *second* predicts an incorrect reading; reconstructing *two* is not necessary to obtain the correct reading. But as she acknowledges, ordinals and numerals also challenge her own neg-raising account, which depends on the ability of the modifier to generate a negative entailment. While *first* and *last* can be assumed to behave like superlatives in this respect since they correspond to the end of a scale, other ordinals like *second* or *twentieth*, which refer to any point on a scale and are thus more similar to comparatives, are not obviously amenable to such an analysis. Furthermore, while Heycock questions the existence of a low reading with numerals like *two*, she admits it with numeral-like modifiers like *few* or *many* in (59), but she does not spell out how this fact can be captured under her neg-raising account.

(59) the few/many books that John said that Tolstoy had written

In sum, while Bhatt's accounts massively overgenerates (any modifier should trigger the low reading), Heycock's account (at least<sup>20</sup>) undergenerates: some modifiers (e.g. *twentieth*, *many*) give rise to the low reading even if they do not seem to intrinsically generate negative entailments.

Our superlative clause hypothesis instead provides a solution as to the relevant class of modifiers that can trigger the low reading: superlatives, *only*, ordinals and numerals are all compatible with a degree-based domain argument or comparison class, which, I hypothesize, can be explicitly expressed by the clause containing the intensional predicate. This is evidenced

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<sup>20</sup> Heycock's account may also overgenerate as it is not clear that all elements with negative entailments trigger the low reading. Note in this respect that Heycock (2005: 368) mentions an imperfect correlation between NPI licensing, negative entailments and low readings: while superlatives or *only* exhibit all three properties, *almost* only exhibits the second one, and *barely* only the first one.

by the striking fact that they all (and only they) can take non-modal subject infinitival clauses (cf. Bhatt 2006), which have been argued to denote comparison classes (Bylinina et al. 2015).

- (60) a. the longest book **to appear here this year**.  
 b. the first book **to appear here this year**.  
 c. the second book **to appear here this year**.  
 d. the only book **to appear here this year**.  
 e. the few books **to appear here this year**.  
 f. the two books **to appear here this year**.

All elements are also compatible with *of*-partitives:

- (61) a. the longest (one) **of these books**.  
 b. the first (one) **of these books**.  
 c. the second (one) **of these books**.  
 d. the only \*(one) **of these books**.  
 e. (\*the) few **of these books**.  
 f. (\*the) two **of these books**.

I thus propose that all and only modifiers triggering the low reading are modifiers that can take a domain argument, and the low reading arises when the clause is construed as a degree-based comparison class. Below, I only sketch how this analysis can apply to each case. A more detailed analysis of ordinals, *only* and numerals will have to await further research.

At first glance, ordinals seem most similar to superlatives since they involve ranking on a scale, although they do not lexically specify the type of ranking, which is usually some spatial or temporal ordering induced by pragmatically or syntactically determined context. As noticed by e.g. Bhatt (2006) or Bylinina et al. (2015), ordinals furthermore exhibit several properties characteristic of superlatives: they give rise to absolute and relative readings, their truth conditions can be influenced by focus, and they can take non-modal subject infinitival clauses (as in (60)b-c). A reasonable analysis is thus to analyze the low reading of *first* just like *longest* in (46), assuming – based on etymology – decomposition of *first* into a superlative morpheme and *fore* (cf. Barbiers 2007).

- (62) a. the longest book [that  $\lambda d$  John said Tolstoy had written ~~a d-long book~~]  
 b. the fore-est book [that  $\lambda d$  John said Tolstoy had written ~~a d-fore book~~]

Just as in (62)a, the clause in (62)b is construed as the domain of comparison complementing *-est*. Unlike in (62)a, however, something must be said about how exactly ordering of writing is here interpreted as the only relevant ordering. As noted by Heycock (2005), it seems that *fore* requires an argument specifying the type of degree property (fore with respect to what?). And as Sharvit (2010) shows, the ordering can in principle be contextually determined (by the way the books are stacked, for example). What will need to be spelled out for (62)b in further research is thus why and how the local verb *write* must play a crucial role in this specification.<sup>21</sup>

<sup>21</sup> Bylinina et al. (2015) propose that non-modal subject infinitival clauses, which denote the comparison class, are responsible for fixing the relevant ordering through a temporal ranking function, which seems to be induced by the verb of the clause and temporal modifiers. But they do not discuss cases involving embedding where the clause denoting the comparison class contains more than one verb.

Further note that Bylinina et al. (2015) observe that ordinals do not seem to trigger upstairs *de dicto* readings (see details about such readings in section 3), which seems to argue against our hypothesis involving split scope. They claim that unlike (viii)b, (ix)a is not felicitous in the following scenario: John wants to take a train departing

This point will also be crucially relevant to how to derive the high reading, where ordering seems to also be determined by material in the clause (the higher verb); in this respect, note that we will discuss the hypothesis that some of the so-called high readings are subclasses of the low reading in section 2.2.4. The other point to specify in future research will concern the extension of the analysis of *first* (or *last* similarly roughly decomposable as *late-est*) to non-extreme ordinals like *second* where an ordinal morpheme (*n-th*) must stand for *-est* in (62)b (see e.g. Alstott 2023 for relevant discussion).

Numeral-like modifiers such as *many* or *few* and numerals like *two* have been the subject of many studies, which cannot be reviewed or evaluated within the scope of this article (see e.g. Rett 2018 for a review about the semantics of quantity words). But at least some parts of this literature reveal that they can also be conceived as similar to superlatives both in taking a domain argument and in being treatable in degree-based accounts. Specifically, the relevant quantity (its cardinality in the case of numerals like *two*, or its position with respect to some standard of quantity in the case of *many* or *few*) needs to be determined based on a set; in recent analyses, this set is a set of degrees denoted by the argument of quantity words (see references in Rett 2018). In our cases, we can thus assume that under the low reading, this set is explicitly expressed by the clause as roughly represented in (63).

- (63) a. the **many** books [that  $\lambda d$  John said Tolstoy had written ~~**d-numbered books**~~  
 b. the **two** books [that  $\lambda d$  John said Tolstoy had written ~~**d-numbered books**~~]

In other words, the low reading of numerals can be assumed to derive from the construal of the clause as an amount relative. Amount relatives have also been the subject of numerous studies that go beyond the scope of this article (see Grosu & Landmann 2017 for a review), but many agree on treating them as degree clauses, which support the idea that our superlative clause hypothesis naturally extends to clauses modifying numerals.

Finally, what about *only*? *Only* is perhaps the topic of even more studies, which cannot be done justice here. But again, several properties liken *only* to superlatives.<sup>22</sup> In fact, Heim's (1995/1999) lexical entry in (47) is explicitly based on the semantics of *only* because both *only* and superlatives require a set of alternatives as argument, which can be determined by focus. Sharvit (2015) even proposes that adjectival *only* is the phonetic realization of *-est*. Furthermore,

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between 3pm and 4pm; Bill and Steve want to take a train departing between 5pm and 6pm, and 7pm and 8pm, respectively.

- (viii) a. John wants to take the first train.  
 b. John wants to take the earliest train.

But this difference arguably derives from the difference between ordinals and superlatives discussed in the main text regarding the (non)specification of the ordering: the fact that the type of ordering is left unspecified with *first* (vs. *early*) makes the upstairs *de dicto* reading hard to access. The difference between *first* and *early* seems in fact diminished with an explicit superlative clause:

- (ix) a. John wants to take the first train that anyone in the group wants to take.  
 b. John wants to take the earliest train that anyone in the group wants to take.

<sup>22</sup> Based on gender mismatch agreement facts also observed with superlatives, Sleeman & Ihsane (2016) suggest that French *seul* (cf. 'only') has to be analyzed as a superlative (vs. a quantifier).

- (x) la seule de mes gentils professeurs qui est malade  
 the.F.SG only.F.SG of my.PL kind.M.PL professors.PL that is sick.SG  
 'the only one of my kind professors who is sick'  
 (xi) la plus intelligente de mes gentils professeurs  
 the.F.SG most intelligent.F.SG of my.PL kind.M.PL professors.PL  
 'the most intelligent of my kind professors'



although this point remains debated, an important group of studies treats *only* as a scalar element, whose semantic contribution is not just to exclude some alternatives, but to exclude alternatives that are higher on a scale; recently, Greenberg (2022) treats *only* as the superlative antonym of *even*, in the sense that *only* presupposes that its prejacent is the weakest alternative in the relevant domain, while *even* presupposes that its prejacent is the strongest alternative. For our purposes, all this means that just as in the case of *longest*, the clause under the low reading can arguably be treated as explicitly denoting the set of alternatives C taken as argument by *only*. Under a scalar, superlative analysis of *only*, the role of *only* is to pick an endpoint of a scale in this set. Continuing the analogy, it is reasonable to further assume that the clause is also a degree clause, as the relevant scale in the case of the low reading is a quantitative one (i.e. John said that Tolstoy wrote one book, no more – vs. John said Tolstoy wrote a book of mediocre quality, not a better one):

(64) the **only** book [that  $\lambda d$  John said Tolstoy had written ~~d-numbered books~~]

Unlike Heycock’s account that *only* relies on the exclusive component of *only* (negating alternatives), this sketched proposal thus also builds on the scalar component of *only*.<sup>23</sup> As in the case of ordinals and numerals, this suggestion would of course require much more investigation both for the cases at hand and for its consequences on the various existing debates about *only* in the literature. The goal of this discussion was limited to providing some concrete suggestions as to how the superlative clause hypothesis could reasonably extend to the few other modifiers displaying low readings (and only to those) and why this may be so.

### 2.2.3. Intervention effects

We saw in section 2.1.2 that both Bhatt and Heycock agree on the fact that low readings are subject to intervention effects. But they disagree on how to characterize the set of interveners: while Heycock takes them to be non neg-raising predicates, Bhatt (& Sharvit) argue that intervention effects arise in the case of negative islands as well as with predicates implying entailment of the high reading by the low reading. Furthermore, both accounts face problems to derive the empirical generalization they argue for: in particular, the facts involving negation do not straightforwardly follow under neither Heycock’s nor Bhatt’s account.

Instead, the superlative clause hypothesis directly accounts for the non-controversial cases of intervention effects such as negation, and provides an explanation as to why some cases remain empirically debated. Under our hypothesis, intervention effects are reduced to those observed with degree quantification: since the superlative clause is treated as a degree clause, it is predicted to be subject to the same intervention effects as degree questions or comparatives as illustrated in (65) with negation.

- (65) a. # the longest book that John didn’t say that Tolstoy had written.  
 b. \* a longer book than John didn’t say that Tolstoy had written (in 1867).  
 c. \* how long a book did John not say that Tolstoy had written?

<sup>23</sup> This explains some differences in how the low reading is described. See discussion in section 2.2.3. Further note that this hypothesis predicts that any other nominal scalar and superlative particle can trigger low readings as long as it is compatible with quantitative scales; the latter point may explain why this is not the case of *mere*.

In other words, the superlative clause hypothesis straightforwardly derives the negative island effects that Bhatt (2002) mentions without being able to explain. It's been noticed since at least Ross (1984) that negative elements interfere with some types of *wh*-movement. Although both the exact empirical generalization and the analysis remain debated (see Rizzi 1990, Szabolcsi & Zwarts 1993, Rullmann 1995, Abrusán & Spector 2011, i.a.), it is uncontroversial that intervention effects with the negation itself or negative verbs such as *deny* arise both with degree and amount quantification. While intervention effects yield ungrammaticality in the former case, they constrain the interpretation to referential readings in the latter case as in (27) above or (66):

(66) How many books did John not say that Tolstoy had written?

For our purposes, we do not need to take a stand on how to analyze negative islands: it suffices to observe that the same intervention effects arise for the low reading of intensional superlatives and for other well-known cases of negative islands. For example, it has been observed that negative islands can be obviated by some properly placed modals (Fox & Hackl 2007):

- (67) a. How fast did Jack drive? (Abrusán & Spector 2011: 108)  
 b. \* How fast didn't Jack drive?  
 c. \* How fast are we allowed not to drive?  
 d. How fast are we not allowed to drive?

Strikingly, the same holds with our low readings:

- (68) a. the fastest (car) that Jack drove  
 b. # the fastest (car) that Jack didn't drive  
 c. # the fastest (car) that we are allowed not to drive  
 d. the fastest (car) that we are not allowed to drive

However, recall that Heycock explicitly points out some cases of intervention that seem to arise with our low readings, but not with amount quantification (see e.g. (29)). Bhatt & Sharvit (2005) also implicitly mention such cases (e.g. (26)) when they argue against Heycock's generalization that *should* or *be likely* do not trigger low readings (such predicates do not give rise to negative islands). Such intervention effects, I argue, are artefacts of the way Bhatt (& Sharvit) and Heycock describe the low readings.

First, note that Heycock makes her point using *only* and *first* (vs. run-of-the-mill superlatives like *longest*). As mentioned by Bhatt & Sharvit, this is problematic in cases in which the high reading includes the low reading, which often happens with *only* (see e.g. (26)). Furthermore, note that the paraphrases used by both Bhatt and Heycock for *only* and *first* usually amount to interpreting the whole modifier within the clause, which, as we discussed in section 2.2.2, is arguably not the correct way to derive the low readings. In the absence of a fully spelled out analysis for *first* and *only*, it thus seems safer at this point to reason on intervention effects based on standard superlatives like *longest* (as also argued by Bhatt & Sharvit 2005).

Bhatt (& Sharvit) and Heycock's reasoning about them is confounded, I argue, by their never considering non-referential readings. For lack of space, I will illustrate this point using only one example that both Bhatt & Sharvit and Heycock treat as a case of intervention effect (although they explain it differently); but as far as I can see, the point extends to all other cases. Specifically, Bhatt & Sharvit (2005: 74) and Heycock (2005: 371) claim that the strong deontic operator *need* intervenes for the low reading.

- (69) That is the only offence that he needed to claim to have committed.  
 ✓ That is the offence such that he did not need to claim that he committed an offence other than that.  
 ✗ That is the offence such that he needed to claim not to have committed an offence other than that. (Heycock 2005: 371)
- (70) The longest book John needs to read is *Anna Karenina*.  
 ✓ The requirements for passing Comp Lit I are: reading *Tom Sawyer*, *Huckleberry Finn*, and *Anna Karenina*. If John doesn't pass Comp Lit I, he will be kicked out.  
 ✗ The requirements for passing Comp Lit II are: reading *Anna Karenina* and no book that is longer than *Anna Karenina*. If John doesn't pass Comp Lit II, he will be kicked out. (Bhatt & Sharvit 2005: 74)

Heycock claims that the meaning indicated by the second paraphrase in (69) is unavailable because *need* blocks neg-raising, and Bhatt & Sharvit claim that the second scenario in (70) is inappropriate because the low reading here entails the high reading. But both (69) and (70) crucially exhibit a referential reading of *the only/longest book*, unlike corresponding low readings of amount or degree questions (to which both Bhatt and Heycock compare low readings); under their low reading, both (71) and (72) only require numbers (of offences or pages, respectively) as answer, not specific entities (offences or books).

(71) How many offences did he need to claim to have committed (to be credible)?

(72) How long a book does John need to read (to pass Comp Lit I)?

The same holds of degree or amount comparatives:

(73) I committed more offences than he needed to claim to have committed (to be credible).

(74) I read a longer book than John needs to read (to pass Comp Lit I).

Crucially, the low reading becomes similarly available if we modify (69) and (70) accordingly:

(75) The only offence that John needed to claim to have committed needed not be important.

(76) The longest book John needs to read to pass Comp Lit I need not be in a foreign language.

Because they do not involve an identificational construction (e.g. *that is X, X is Anna Karenina*) (75) and (76) are compatible with a non-referential reading that highlights the low reading. Recall that under our hypothesis, only *d-long* (not *-est*) is interpreted in the scope of the intensional predicate under the low reading. Accordingly, (76) is felicitous in scenarios in which only a certain length of book (vs. a specific book) defines the requirements, e.g. if to pass Comp Lit I, John must read two specific French and German 50-page novels as well as any 500-page novel (e.g. taken from a list); in those cases, the book in question is not specific (unlike in (70) where the longest book is specific although the shorter books are not). Similarly, (75) favors an interpretation where no specific offence is in question: the crucial point is that John had to claim to have committed only *one* offence (vs. only *that* offence in (69)<sup>24</sup>).

<sup>24</sup> Under such referential readings of *only* discussed by Heycock, it may well be the case that the availability of apparent low readings depends on the availability of neg raising as she argues (which will affect the interpretation of how the alternatives are excluded). But these readings (and the intervention effects they are subject to) should not be treated on a par with low readings of superlatives like *longest*: under our hypothesis, the clause could also

The hypothesis that the intervention effects for our low readings can be reduced to intervention effects for degree quantification is further supported by the behavior of intensional superlatives in the presence of *which* (vs. *that*) relativizers, which parallels the behavior of so-called amount relatives such as (77).

(77) It will take us the rest of our lives to drink the champagne {that/ % which} they spilled at the party. (cf. Heim 1987: 38)

(78) the longest book {that /% which} John said that Tolstoy had written.

Amount relatives, which are standardly argued to involve degree relativization (see Carlson 1977, Heim 1987, Grosu & Landmann 1998, Herdan 2008, i.a.) are claimed to disallow *wh*-relativizers (at least for a significant portion of speakers). For instance in (77), the amount reading, under which it is the amount of champagne (vs. the actual champagne) spilled that is under discussion, is unavailable with *which* (vs. *that*). Similarly, the low reading is absent (at least for a large number of speakers) in (78) when it involves a *which*-(vs. *that*)-clause (cf Howard 2014: fn.7 and fn.17).

In sum, the superlative clause hypothesis provides a straightforward solution to the problem of intervention effects: because it involves degree relativization, it predicts negative islands effects (and any other intervention effect observed with degree quantification); other purported intervention effects are illusory and due to the interpretive constraints derived from split scope.

#### 2.2.4. NPI licensing

Finally, the superlative clause hypothesis also derives the NPI facts as long as the relevant readings are reexamined and the meaning contribution of *ever* is carefully taken into account. Recall from section 2.1.1 that according to Bhatt (& Sharvit), the correlation between the position of *ever* and the type of reading supports a reconstruction account.

(79) a. the longest book that John ever said that Tolstoy had written  
b. the longest book that John said that Tolstoy had ever written (Bhatt 2002: 60)

According to Bhatt (& Sharvit), high *ever* in (79)a is only compatible with the high reading because under the low reading, *longest* cannot license *ever* from its reconstructed position; low *ever* in (79)b is only compatible with the low reading because the domain widening contributed by *ever* in that case yields a felicitous reading only if the superlative is interpreted in the scope of *said*.<sup>25</sup> Under Heycock's approach, however, it is because it blocks neg-raising that high *ever* obligatorily triggers the high reading; and intervention effects by universal quantifiers imply that low *ever* should be licensed by high *longest* and thus (although Heycock does not specify this), low *ever* should be compatible with either reading in the presence of a neg raising

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be taken to denote the domain of comparison in these cases, but there would be no degree quantification or split scope. See discussion in section 2.2.2.

<sup>25</sup> In languages like French, the subjunctive gives rise to the same kind of contrast (see e.g. Sleeman 2010 about superlatives taking subjunctive clauses):

(xii) a. le plus long livre que Jean ait (jamais) dit que Tolstoï avait écrit  
the.M.SG most long.M.SG book that John has.SUBJ ever said that Tolstoy had written  
b. le plus long livre que Jean a dit que Tolstoï ait (jamais) écrit  
the.M.SG most long.M.SG book that John has said that Tolstoy has.SUBJ ever written

predicate and only with the high reading with a non neg raising predicate. Thus, NPI facts again give rise to both empirical and analytical disagreement.

As we detail below, the split scope implied by the superlative clause hypothesis provides a way to solve the problem: the low reading (in the sense of scoping *d-long* – vs. *longest* – low), and crucially only this reading, is in fact compatible with both low and high *ever* (as implied by Heycock’s hypothesis), but the meaning contribution of *ever* gives the illusion that high *ever* triggers a high reading (in the sense of scoping the whole superlative *longest* high).

It is well-known that comparative clauses license NPIs (von Stechow 1984, Heim 1985, i.a.).

- (80) a. a longer book than John ever said that Tolstoy had written  
b. a longer book than John said that Tolstoy had ever written

Under the superlative clause hypothesis, it is thus predicted that just as in (80), *ever* can be similarly licensed both in high and low positions when the clause is construed as a superlative clause.

Note that as mentioned in the introduction, NPI licensing is the argument motivating Howard’s (2014) hypothesis that some apparent relative clauses are in fact superlative degree clauses. Howard shows that standard theories of NPI licensing based on Strawson-Downward entailment can predict that superlatives license NPIs only under absolute readings (cf. von Stechow 1999, Heim & Sharvit 2006, Gajewski 2010); under relative readings, which imply VP scope of *-est*, Strawson downward entailing inferences are invalidated as illustrated in (81).

- (81) a. John read the most books that anyone in the class has ever read.  
b. John read the most books.  
c. John read the most travel books. (Howard 2014: 11-12)

The superlative *the most*, which only triggers relative readings and must thus take VP scope under a Heimian hypothesis, licenses the NPIs *ever* or *anyone* as shown in (81)a. Yet, (81)b does not Strawson entail (81)c: just because John read more books than anyone else, it does not follow that he read more books of a particular type than anyone else; *-est* does not create a downward entailing environment in its VP complement.

As Howard argues (cf. Bumford & Sharvit 2022), treating the clause in (81)a as a superlative degree clause solves the conundrum: just like e.g. *every*, *-est* is not downward entailing with respect to its scope, but it is with respect to its restrictor; in other words, *-est* creates a downward entailing environment in C, but not in P under Heim’s lexical entry in (47). Under the hypothesis that the clause explicitly denotes C, it follows that it is Strawson downward entailing and thus licenses NPIs. In fact, (82)a does entail (82)b provided that John is a syntactician.

- (82) a. John has published the most papers any linguist has published.  
b. John has published the most papers any syntactician has published. (Howard 2014: 38)

But Howard (cf. Bumford & Sharvit 2022) only applies this explanation to relative readings: under absolute readings, so the argument goes, clauses like the bracketed one in (83) cannot be treated as superlative clauses because under this construal, the correct truth conditions cannot obtain under Heim’s lexical entry in (47) as discussed in section 2.2.1.

- (83) *War and Peace* is the longest book [Tolstoy ever wrote]. (Howard 2014: 50)

The point of the present article is instead to argue that such bracketed clauses can in fact also be treated as superlative clauses; and in section 2.2.1, we discussed ways to overcome the semantic problems raised by this construction, which we argue are solved by assuming ellipsis of a near-identical clause.<sup>26</sup> In fact, Howard’s theory-independent argument in (82) carries over to (83): (84)a entails (84)b provided that Tolstoy wrote *War and Peace* in the 1860s.

- (84) a. *War and Peace* is the longest book Tolstoy (ever) wrote in the nineteenth century.  
 b. *War and Peace* is the longest book Tolstoy (ever) wrote in the 1860s.

In sum, our superlative clause hypothesis predicts that NPIs like *ever* can be licensed in any position in the clause construed as a superlative clause.

Given that under our hypothesis, we saw that the so-called low reading derives from the superlative clause construal entailing split scope, it should thus be compatible with both *low* and high *ever*. But this seems to go against Bhatt and Heycock’s converging claim that high *ever* only triggers the high reading. This apparent problem, I claim, is resolved by the split scope hypothesis implying that high *ever* triggers a low reading – in the sense that book lengths are evaluated by John – that resembles the high reading – in the sense that the superlative comparison is done by the speaker.

More specifically, the NPI *ever*, which quantifies over time, affects the interpretation of the comparison set under our hypothesis, since it is part of the superlative clause as represented in (85).

- (85) a. the longest book that  $\lambda d$  John ever said that Tolstoy had written ~~a d-long book~~  
 b. the longest book that  $\lambda d$  John said that Tolstoy had ever written ~~a d-long book~~

Recall from our discussion in section 2.2.1 that one crucial difference between comparatives and superlatives is that the former are relational while the latter are partitive, so that comparative clauses must denote a single element (e.g. a maximal degree under many analyses), while superlative clauses must denote a set thereof. As argued by Howard (2014), NPI indefinites can crucially contribute to the creation of this set in a way similar to wh-words or focused elements by specifying the parameter through which the set is determined (see details in Howard 2014: 41-45). For example, *ever* can contribute to creating the comparison set C through quantification over times as exemplified in (86).

<sup>26</sup> The problem of NPI licensing with relative readings identified by Howard may thus be solved without having to postulate homonymy between *-est* for relative readings (Heim’s lexical entry in (xiii)) and *-est* for absolute readings (von Fintel’s lexical entry in (xiv)) as in Howard (2014) (and without failing to derive the upstairs *de dicto* reading as in Bumford & Sharvit 2022 that propose a dynamic take on superlative semantics to solve the NPI licensing problem with relative superlatives).

(xiii)  $\llbracket -est \rrbracket (C_{\langle dt, t \rangle})(P_{\langle dt \rangle}) = 1$  iff  $\exists d \mid P(d)=1$  and  $\forall Q \mid C(Q)=1$  and  $Q \neq P$ ,  $Q(d)=0$ . (Heim 1995/1999)

(xiv)  $\llbracket -est \rrbracket (P_{\langle d, et \rangle})(Q_{\langle et \rangle})(\alpha_e) = 1$  iff  $\exists d \mid P(d)(\alpha)=1$  and  $\forall y \mid Q(y)=1$  and  $y \neq x$ ,  $P(d)(y)=0$

(cf. von Fintel 1999 as translated by Howard 2014: 53)

All cases can be captured using (xiii), where the environment licensing NPIs is the domain argument (the superlative clause C (cf. the NP Q in (xiv)) because it is Strawson downward entailing.

It remains to be seen if a full unification is possible, namely if (xiii) can apply to cases where the domain argument does not seem straightforwardly amenable to a degree clause analysis as in (xv).

(xv) The highest mountain of any island

Promisingly, this question amounts to applying to the superlative domain the debate between individual- and degree-based analyses of comparatives for phrasal comparatives (see introduction). A positive answer would lead us to analyze (xv) roughly as *the highest mountain that  $\lambda d$  any island has a d-high mountain that an island has a d-high mountain*.

- (86) a.  $C = \{\lambda d. \text{John said at } t \text{ that Tolstoy had written a } d\text{-long book} \mid t \in D_i\}$   
 Example:  $C = \{\lambda d. \text{John said in 2015 that Tolstoy had written a } d\text{-long book}, \lambda d. \text{John said in 2020 that Tolstoy had written a } d\text{-long book}, \lambda d. \text{John said in 2022 that Tolstoy had written a } d\text{-long book}\}$   
 b.  $C = \{\lambda d. \text{John said that Tolstoy had written a } d\text{-long book at } t \mid t \in D_i\}$   
 Example:  $C = \{\lambda d. \text{John said that Tolstoy had written a } d\text{-long book in 1867}, \lambda d. \text{John said that Tolstoy had written a } d\text{-long book in 1877}, \lambda d. \text{John said that Tolstoy had written a } d\text{-long book in 1886}\}$

High *ever* in (85)a thus induces the comparison set in (86)a, where the degree sets forming the set denoted by the superlative clause vary along the dimension of John's saying times: the comparison set includes lengths of books by Tolstoy that were mentioned by John at different times (e.g. in 2015, 2020, 2022). Low *ever* in (85)b, however, induces the comparison set in (86)b, where the degree sets forming the comparison set vary along the dimension of Tolstoy's writing times according to John: the comparison set includes lengths of books that were written by Tolstoy at different times according to John (e.g. in 1867, 1877, 1886).

This distinction gives rise to a difference of interpretation that resembles that invoked for distinguishing between the low and the high readings, although both interpretations correspond to variants of the low reading under my hypothesis (in the sense that *d-long* is interpreted low). Recall that one way used by Bhatt (2002) to paraphrase the low vs. high readings in the case of *first* is to specify whether it is the order of saying or the order of writing that matters. In the case of *longest*, the difference focuses on whether the comparison is made between lengths of books mentioned at different times ((86)a) or written at different times ((86)b). In both cases, the comparison is explicitly expressed to be made by the speaker (*-est* scopes over *said*). In (86)b, it is implied that John also made the comparison at least implicitly, since he expressed an opinion about all relevant book lengths (presumably at the same time in the absence of indication to the contrary), under the assumption that his thinking obeys logical rules. But in (88)a where John expressed opinions about book lengths at different times, this implication does not necessarily hold: making a length comparison requires not only knowing the lengths of the elements to be compared and the logical ordering rule, but also holding all lengths simultaneously in memory. This consideration explains how the other common paraphrase used for the high vs. low readings, namely "longest according to the speaker vs. John" can correspond to our two variants of the low reading.

Our hypothesis thus implies that the so-called high reading corresponds to two possible logical forms, and some confusion in the literature comes from the near equivalence of these LF's under some circumstances, which can be described using various (potentially misleading) paraphrases.

- (87) a. the longest book (that/which) John said that Tolstoy had written ~~a book~~  
 b. the longest book (that)  $\lambda d$  John (ever) said that Tolstoy had written ~~a d-long book~~

Specifically, the first LF (that assumed by all the previous literature for the high reading) involves high scope of the whole superlative. Under my hypothesis, this is the LF in (87)a under which the clause is interpreted as a standard relative clause (vs. a superlative clause); for a subset of speakers, the use of *which* (vs. *that*) relativizers forces this construal (cf. (78)). Under this LF, John need not be opinionated about book lengths and the comparison is done by the speaker among books by Tolstoy according to John. The second LF is the same LF I assume for the low reading, namely the one in (87)b where the clause is construed as a degree

superlative clause and *d-long* (vs. *-est*) is interpreted low. Under this LF, John is opinionated about book lengths and the speaker is responsible for making the comparison between these lengths assumed by John; by default, John's opinion about book lengths implies a comparative judgment by John (which thus amounts to Bhatt's low reading), but this is not necessarily the case if these opinions are spread over times as is forced by the modification of the intensional predicate by *ever* (which thus amounts to Bhatt's high reading). In sum, both low and high *ever* can be associated with a superlative clause construal, and the difference of reading does not derive from a scopal difference of (part of) the superlative adjective, but from the difference of interpretation of the comparison class induced by the placement of *ever*.<sup>27</sup>

This hypothesis is further supported by Heycock's (2019) observation that the placement of *ever* does not correlate with binding conditions C (as we saw in (16)) or A as shown in (88).

- (88) That is the only/first picture of himself<sub>i</sub> that I ever thought Freud<sub>i</sub> might sell.  
(Heycock 2019: 96)

Contrary to Bhatt's predictions and in support of ours, *himself* can be bound in the low clause by *Freud* (which is not construed as a logophoric center here and can't thus yield exemption from Condition A) in (88) involving high *ever*.<sup>28</sup>

Yet further corroboration of our hypothesis comes from the fact that negative islands are not just observed with low *ever*, but also with high *ever*:

- (89) a. \*It is the longest book that John ever denied that Tolstoy wrote.  
b. \*It is the longest book that John denied that Tolstoy ever wrote.

<sup>27</sup> The superlative clause hypothesis also straightforwardly derives the readings observed with other NPIs: for example, the comparison set in (xvi) involving *anyone* is created through quantification over individuals as shown in (xvii).

- (xvi) a. The longest book that anyone said that Tolstoy wrote.  
b. The longest book that John said that anyone wrote.

- (xvii) a.  $C = \{\lambda d. x \text{ said that Tolstoy wrote a } d\text{-long book} \mid x \in D_e\}$

Example:  $C = \{\lambda d. \text{John said that Tolstoy had written a } d\text{-long book}, \lambda d. \text{Antonia said that Tolstoy had written a } d\text{-long book}, \lambda d. \text{Siouxsie said that Tolstoy had written a } d\text{-long book}\}$

- b.  $C = \{\lambda d. \text{John said that } x \text{ wrote a } d\text{-long book} \mid x \in D_e\}$

Example:  $C = \{\lambda d. \text{John said that Tolstoy had written a } d\text{-long book}, \lambda d. \text{John said that Balzac had written a } d\text{-long book}, \lambda d. \text{John said that Joyce had written a } d\text{-long book}\}$

Multiple NPIs are also correctly predicted to create sets through multiple quantification (e.g. over times and individuals in the presence of both *ever* and *anyone*; see Howard 2014; see also section 4).

In the absence of any NPI, it can either be assumed that the default quantification is over times or that focus on the head trace creates the relevant domain of quantification over individuals as proposed in section 2.2.1. In this respect, note that NPIs and focus can create sets in similar ways (cf. Howard 2014).

Further note that in the elided clause (not noted in this section for ease of presentation), the implicit correlate should not be focused or should be a non-universal (deictic or existential) counterpart of the NPI (see further discussion in sections 2.2.1 and 3.2). This can be compared with similar cases involving comparatives like (80) (e.g. *Tolstoy wrote a longer book (then) than he ever wrote*; *John gave a bigger gift (to her/someone) than he gave to anyone*) and with ellipsis cases in which polarity items license the ellipsis of their non-polarity counterparts (e.g. *John didn't see anyone, but Mary did [see someone]*, see Merchant 2010, i.a.).

<sup>28</sup> Heycock (2019) also shows that the contrast reported by Hulsey & Sauerland (2006: 116) in (xviii) regarding extraposition cannot be used as reliable evidence. According to Hulsey & Sauerland, extraposition, which excludes a raising analysis of relative clauses, is incompatible with low *ever* as predicted by Bhatt. But the small-scale questionnaire presented by Heycock (2019: 103-106) casts doubt on this contrast as it does not reveal the contrasts predicted by Hulsey & Sauerland (2006) regarding extraposition.

- (xviii) a. \*I read the first novel last week that John said that Tolstoy had ever written.  
b. I read the first novel last week that John ever said that Tolstoy had written.



Conversely, subject non-modal infinitive clauses (which denote the domain of comparison as discussed in section 2.2.2) do not only license low *ever*, but also high *ever*:

- (90) a. The longest book to have ever been said to have been written by Tolstoy
- b. The longest book to have been said to have ever been written by Tolstoy

Moreover, non-referential readings (see (76)) are available with high *ever*:

- (91) The longest book John will ever need to read to pass his classes should not exceed 1000 pages.

To complete the argument, we must clarify how NPI licensing works under relative clause construals. So far, we have explained why both high and low *ever* are compatible with a superlative clause construal, and why under this construal, high *ever* can be described as entailing a high reading, and low *ever* a low reading. But our hypothesis does not exclude a relative clause construal, which induces a high reading. How does it interact with NPI licensing? Given the monotonicity profile of *-est* we discussed above, our hypothesis implies that NPIs can only be licensed if they occur in the domain of comparison (i.e. in C). If the clause is construed as a relative clause outside the domain of comparison, it is correctly predicted not to license NPIs. This reading can be facilitated if we add another possible explicit domain of comparison as in (92).

- (92) the longest book in the list (that/which) John said that Tolstoy had (#*ever*) written ~~a book~~

If the comparison is established among books on the list (of reading assignments, for example), the clause must be construed as a relative clause whose semantic contribution is to restrict the reference of the longest book of the list to be a book by Tolstoy according to John; under that reading, *ever* is unacceptable.<sup>29</sup>

The last issue bears on whether relative clauses can be construed as individual-based domains of comparison, under the assumption that there are two possible superlative morphemes, i.e. one degree-based and one individual-based as debated in the literature on comparatives (cf. introduction and fn. 26). If so, such relative clauses are predicted to license NPIs. Note that this is also von Stechow's 1999 prediction since under his hypothesis, NPIs can be licensed under absolute readings as long as they appear in the NP argument of the superlative (see fn. 26). Furthermore, this hypothesis does not impose any restriction on the position of NPIs within the clause, so that both low and high *ever* are predicted to be acceptable in such clauses. Low *ever* is therefore predicted to be compatible with a high reading (i.e. *ever* should be able to modify *wrote* in (85)b even when *d-long* is not interpreted low). This means that (85)b should be expected to refer to Tolstoy's longest book according to the speaker in a scenario where the speaker and John disagree about the lengths (especially the highest one) of Tolstoy's books (but not about authorship).<sup>30</sup> This is precisely what is claimed not to be the case by the previous literature: low *ever* forces the ascription of the length judgment to John (vs. the speaker). This judgment seems to be supported by the contrast between (93)a and (93)b: the high reading with

<sup>29</sup> The other (less accessible) reading is a reading under which the clause denotes the domain of comparison (and thus licenses *ever*) and is extraposed, while *in the list* modifies *book*. See fn. 28 on extraposition.

<sup>30</sup> Furthermore, note that Bhatt & Sharvit's strategy to rule out the high reading with low *ever* is not satisfactory because it relies on the assumption that under the high reading, *book* must be interpreted only high; but relative clauses routinely involve interpretation of the head both low and high, so that the hypothesis that *longest* is interpreted only high does not imply that *book* must also be interpreted only high (see e.g. Sportiche 2016).

low *ever* seems clearly less available in (93)b than in (93)a when the relative clause appears in a partitive construction (and is thus forced to be both individual-based and within the domain of comparison).<sup>31</sup>

- (93) a. the longest of the books that John said that Tolstoy had ever written  
 b. the longest book that John said that Tolstoy had (#ever) written

This observation suggests that relative clauses cannot be construed as individual-based domains of comparison. Why this would be so remains to be further investigated.<sup>32</sup> For our present purposes, what crucially matters is that apparent relative clauses can be construed as degree-based domains of comparison, and as we saw in this section, this construal can explain all the properties of the so-called low reading of intensional superlatives. The goal of the next section is to show that similarly, the superlative clause hypothesis can parsimoniously derive the properties of upstairs *de dicto* readings – the mirror case of intensional superlatives, which involves scopal interaction between superlatives and intensional predicates in the other direction.

### 3. Upstairs *de dicto* readings

Upstairs *de dicto* readings (as dubbed by Sharvit & Stateva 2002) have been identified by Heim (1995/1999) as a fifth possible reading of sentences like (94) involving an intensional predicate and a superlative.

- (94) John wants to climb the highest mountain.

As observed by Heim (1995/1999), (94) is descriptively multiply ambiguous. First, the superlative induces an ambiguity between an absolute reading and a relative reading, depending on whether the comparison set includes all relevant mountains or all relevant climbers (see discussion of (5)). Second, the intensional predicate triggers an ambiguity between *de re* and *de dicto* readings depending on who the judgment about the highest mountain is ascribed to – the speaker or John. The combination of these two sources of ambiguities gives rise to four possible readings: absolute *de re* (the mountain that John wants to climb is actually higher than all other (relevant) mountains, i.e. Mount Everest), absolute *de dicto* (John wants to climb a mountain he thinks to be higher than all other (relevant) mountains, e.g. K2 or some imaginary mountain that he thinks is the highest of all mountains), relative *de re* (the mountain that John wants to climb is actually higher than the mountains that all other (relevant) people want to climb, e.g. Mount Sainte-Victoire), relative *de dicto* (John wants to climb a higher mountain than all other (relevant) people, it does not matter which one). These readings can be derived if we standardly assume different scope options for the DP *the highest mountain* (below or above *want*) and different choices for the implicit domain of comparison of *-est*.

<sup>31</sup> Under the hypothesis discussed in section 2.2.2, this suggests that low *ever* in (xix) should be compatible with *only* only under a quantitative interpretation of the scale. That is, (xix) entails that John said that in all his life, Tolstoy has only written one book (vs. only some specific book).

(xix) the only book John said Tolstoy had ever written

<sup>32</sup> This may provide an argument for the hypothesis that superlatives only have degree-based domains of comparison (vs. individual-based domains of comparison, cf. debate on phrasal comparatives, see e.g. Tomaszewicz 2020). Further arguments should bear on whether *of*-phrases can be interpreted as sets of degree (see fn. 26).

But Heim (1995/1999) shows that there is yet another, more problematic reading under which the mountain height seems to be determined *de dicto*, but the relative comparison seems to be made *de re*. This reading is salient in a scenario in which the speaker conducts a survey about various people's athletic ambitions, which reveals, for instance, that John wants to climb a 6000m high mountain, Mary wants to climb a 4000m high mountain, and Bill wants to climb a 1000m high mountain. This reading is relative because the comparison is made between aspirant climbers (vs. mountains). But it is not a relative *de dicto* reading because John does not have any comparative desire (so that *the highest mountain* cannot scope below *want*), and it is not a relative *de re* reading either because there isn't any specific mountain that John wants to climb (so that *the highest mountain* cannot scope above *want*).

This observation leads Heim to motivate an analysis (which I will henceforth refer to as the movement theory) under which *-est* moves above *want* (i.e. upstairs) while *d-high mountain* remains below it (i.e. *de dicto*). Strikingly, this hypothesis is the mirror image of the superlative clause hypothesis we have discussed in the previous section regarding intensional superlatives: in the case of intensional superlatives, the superlative surfaces higher than the intensional verb even if the judgment of measure (e.g. book length) can be made *de dicto*; in the case of upstairs *de dicto* readings, the superlative surfaces lower than the intensional verb even if the comparative judgment can be made *de re*. The conundrum can be solved in both cases by splitting the scope of *-est* and the gradable predicate across the intensional predicate.

As Heim herself details, the movement theory is however not without problems; in fact, upstairs *de dicto* readings may be the only strong argument for this theory against the so-called in situ theory (under which *-est* remains within the DP). The goal of this section is to argue that the superlative clause hypothesis provides an improvement on the movement theory that retains its crucial advantages over the in situ theory (i.e. split scope) while avoiding some of its shortcomings. This solution relies on the hypothesis that superlative clauses, just like comparative clauses, can be fully elided as shown in (95).

- (95) a. John wants to climb the high-est mountain [that  ~~$\lambda d$  anyone wants to climb d-high mountain].  
 b. John wants to climb a higher mountain [than  ~~$\lambda d$  someone wants to climb d-high mountain].~~~~

Note that here, I assume that it is the domain of comparison that is elided under identity with the clause containing the correlate, while in the case of intensional superlatives, it was conversely the correlate clause that was elided under identity with the domain of comparison. We'll start by reviewing to what extent upstairs *de dicto* readings support the movement theory against the in situ theory (in section 3.1) before examining how the superlative clause hypothesis improves on them (in section 3.2).

### 3.1. The movement theory vs. the in situ theory

#### 3.1.1. Arguments for the movement theory

First, the derivation of upstairs *de dicto* reading is the clearest advantage of the movement theory over the in situ theory. Heim (1995/1999) shows that this reading cannot be derived if the domain of comparison is construed in situ, i.e. within the DP as in (96).

(96) John wants  $\lambda w$  [PRO to climb<sub>w</sub> [the C/f(w)-est [high<sub>w</sub> mountain<sub>w</sub>]]]<sup>33</sup>

Whether the domain argument is assumed to vary with the desire worlds (using  $f(w)$ ) or not (using  $C$ ), no value can be found that can express the relevant reading (see details in Heim 1995/1999: 8-9), unless some machinery specific to relative readings is postulated: Farkas & Kiss (2000) propose that the noun (e.g. *mountain*) can be interpreted in relation to a correlate (e.g. *John*) and a predicate (e.g. *want to climb*) through some kind of e-type binding; Sharvit & Stateva (2002) propose that the DP (e.g. *the highest mountain*) can be interpreted as a property. These mechanisms mimic split scope without assuming movement.

Instead, the movement theory straightforwardly derives the upstairs *de dicto* reading because it licenses split scope of *-est* (above the intensional predicate) and the gradable nominal (below the intensional predicate). This can be done in two variants represented in (97) and (98).

- (97) a. John [C -est]  $\lambda d$  [want<sub>w0</sub>  $\lambda w$  [PRO to climb<sub>w</sub> a d-high<sub>w</sub> mountain<sub>w</sub>]]  
 b.  $\exists d \mid$  John wants to climb a d-high mountain and  $\forall y \in C \mid y \neq \text{John}, \neg y$  wants to climb a d-high mountain
- (98) a. [C -est]  $\lambda d$  [John want<sub>w0</sub>  $\lambda w$  [PRO to climb<sub>w</sub> a d-high<sub>w</sub> mountain<sub>w</sub>]]  
 b.  $\exists d \mid$  John wants to climb a d-high mountain and  $\forall Q \mid C(Q)=1$  and  $Q \neq \lambda d \lambda w$  John wants to climb a d-high mountain in  $w$ ,  $\neg Q(d) = 1$  (i.e.  $\neg x$  wants to climb a d-high mountain,  $x \in D_e$  &  $x \neq \text{John}$ )

(97) is based on the three-place lexical entry of *-est* (see (36)) and involves covert movement of *-est* to the position between the subject *John* and the VP, which yields abstraction over degrees and creation of a 2-place relation between degrees and individuals (i.e. the relation that  $x$  bears to  $d$  iff  $x$  wants to climb a d-high mountain); the domain of comparison consists in a set of contextually determined individuals that are relevant aspirant climbers. (98) relies on the two-place lexical entry of *-est* (see (38)) and involves covert movement of *-est* to the propositional level; the domain of comparison consists in a set of degree properties corresponding to the focus value of the complement of *-est* (i.e. in case *John* is focused, the set of properties of degrees  $d$  such that  $x$  – John or any relevant alternative individual – wants to climb a d-high mountain). Due to split scope of *-est* and *d-high mountain*, it is correctly predicted in both cases that a specific desire of climbing achievement is attributed to John which does not involve any particular mountain, while the comparison between climbing desires is made by the speaker.

Second, the core ingredient of the movement theory, namely covert movement of *-est*, is independently motivated by island effects.

(99) # John admires everyone who climbed the highest mountain. (Heim 1995/1999: 15)

For example, (99) does not exhibit a relative reading under which John is compared to other admirers of climbers and identified as the most demanding one (i.e. the climbers admired by John climbed a higher mountain than the climbers admired by the other (relevant) people); this fact follows from the movement theory since this reading would require moving *-est* out of a complex DP island.

<sup>33</sup> Heim (1995/1999) considers an alternative to this LF (see (xx)) involving QR of the superlative DP to capture the disambiguating effect of focus in superlatives in analogy to focus effects with adverbs of quantification like *always*. The intended upstairs *de dicto* reading cannot be captured by this LF either.

(xx)  $\lambda w_0$  [John wants<sub>w0</sub>  $\lambda w_1$  [[the [ $\cup f(w_1)$  -est] [high<sub>w1</sub> mountain<sub>w1</sub>]] [ $\lambda x$  [PRO to climb<sub>w1</sub>  $x$ ]  $\sim f(w_1)$ ]]]

This type of explanation has already been proposed for comparatives, which exhibit the same kind of effects as illustrated in (100).

- (100) John admires everyone who climbed a higher mountain than Mary {\*does (admire)/did (climb)}.

The unacceptability of the reading under which Mary is compared to John as an admirer has been claimed to derive from the constraints on movement of *-er* (Heim 1985, Heim 2001; cf. Charnavel 2015, i.a., about similar facts with *same/different*).<sup>34</sup> Under the movement theory, this explanation directly carries over to superlatives. On the contrary, such effects cannot (straightforwardly) be explained by the in situ theory.

Third, Heim notes that the movement theory can account for relative readings involving arguments of transitive adjectives.

- (101) a. John is angriest at Mary.  
 b. Mary [C -est]  $\lambda d \lambda x$ [John is d angry at x]  
 c. [C -est]  $\lambda d$  John is d angry at MARY]

The reading under which John is angrier at Mary than he is at anyone else can be captured by assuming *-est* movement as in (101)b (Heim 1995/1999: 11) or (101)c depending on the lexical entry adopted. It is not obvious how to derive this reading under the in situ theory.

Finally, Bumford (2018) shows that sloppy readings of superlatives such as (102) provide a further argument for the movement theory.

- (102) John picked out the fewest books with his name in the title.  
 a. Strict reading: John picked fewer books with John's name in the title than anyone else picked with John's name in the title  
 b. Sloppy reading: John picked fewer books with John's name in the title than anyone else picked with their own name in the title

The problem for in situ analyses is that however the domain of comparison for the superlative is computed, the superlative has to quantify over the noun phrase 'books with his name in the title' where the pronoun is rigidly bound to John: only the strict reading is predicted to arise. Scope-taking theories of superlatives have no comparable difficulty because the superlative quantifies over a constituent large enough that the pronoun can be bound – strictly or sloppily – within it.

### 3.1.2. Arguments against the movement theory

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<sup>34</sup> Heim (1985) is not definitive about the exact type of constraints *-er* and *-est* are subject to. Indeed, the generalization proposed by Szabolcsi (1986) implies tighter restrictions on relative readings than island restrictions. For example, Szabolcsi (1986) claims that (xxi) does not exhibit a relative reading where the comparison is made with respect to the subject of *say* (i.e. 'who claimed for a smaller n than anyone else did that you got n letters?', Heim 1995/1999: fn. 26).

(xxi) Who said that you got the fewest letters?

The judgments about this type of sentences seem to me to be less clear than about sentences like (99)-(100) involving islands. This is consistent with the hypothesis that movement of *-er* and *-est* is similar to Quantifier Raising (Heim 2001) where clausemateness restrictions are debated (see e.g. Farkas 1981 vs. Fox 2000). See further discussion in section 3.2.1.

It thus seems that the movement theory fares better than the in situ theory to predict the distribution of relative readings in a principled way. But as acknowledged by Heim (1995/1999), the movement theory also faces some problems.

First, the movement theory requires interpreting the determiner as an indefinite determiner in LFs involving *-est* movement. This is the case for both semantic and syntactic reasons. Semantically, upstairs *de dicto* readings, for instance, require an indefinite interpretation of the gradable nominal: in the scenario discussed in (94), John wants to climb any 6000m high mountain; his desire does not imply that there is only one such mountain (in his desire worlds or in the real world). Syntactically, moving *-est* out of a definite DP would violate island constraints.

Second, the movement theory implies some redundancy. For instance, the relative reading in (103) can be derived by construing *-est* in situ (as in (103)a, assuming that C is contextually restricted to mountains climbed by relevant climbers) or by moving it (as in e.g. (103)b based on 3-place *-est*).

- (103) John climbed the highest mountain.  
 a. John climbed [the [C-*est*]  $\lambda d$  [d-high mountain]]  
 b. John [C-*est*]  $\lambda d$  [climbed [a d-high mountain]]

Worse, Sharvit & Stateva (2002) show that (103)b is empirically not supported. As already mentioned by Heim (1995/1999: 13-14), (103)a and (103)b do not have identical truth conditions in scenarios involving ties. One type of scenario involves ties between climbers. For example, let's imagine that John and Bill climbed the same mountain, which is higher than mountains climbed by other people. Under such a scenario, (103)a is predicted to be true, but (103)b is predicted to be false.<sup>35</sup> Both Heim and Sharvit & Stateva agree that the judgments are not clear in such cases. But Sharvit & Stateva argue that (103) is not false, but at best misleading, which can only be explained under the in situ theory, if it is assumed that focus on John induces a (cancellable) implicature that the alternatives are false.

Another type of scenario involves ties between mountains. For example, let's consider a scenario where John climbed two 4000m mountains, while the other climbers reached lower summits. In this scenario, (103)a is predicted to be neither true nor false (because there is no mountain that is highest), and (103)b is predicted to be true. According to Sharvit & Stateva (2002), many speakers hesitate when judging (103), thus corroborating the in-situ analysis; for speakers who judge (103) true, it can be assumed that one of John's mountains can be ignored in the comparison set.

There is yet another case that is empirically problematic for the movement theory according to Sharvit & Stateva (2002), which they refer to as sandwich scenarios.<sup>36</sup> It involves negative superlatives as in (104).

<sup>35</sup> Under the LF based on 2-place *-est* in (xxii), the prediction depends on whether the lexical entry involves degree sets or degree properties (see fn. 10). The latter case predicts falsity as in (103)b, but the former case predicts truth as the set of degrees *d* such that John climbed a *d*-high mountain is indistinguishable from the set of degrees *d* such that Bill climbed a *d*-high mountain.

(xxii) [C-*est*]  $\lambda d$  John climbed a *d*-high mountain

<sup>36</sup> Sharvit & Stateva (2002) (cf. Farkas & Kiss 2000) consider (xxiii) as a further argument against the movement analysis. According to them, (xxiii) does not yield a relative reading; this is expected under the in situ theory because the PP directly constrains the choice of the comparison set; but this does not (straightforwardly at least)

- (104) John climbed the least high mountain.
- a. John climbed [the [C-least]  $\lambda d$  [d-high mountain]]
  - b. John [C-least]  $\lambda d$  [climbed [a d-high mountain]]
  - c. John [C-est]  $\lambda d$  [climbed [a not d-high mountain]]

Consider a situation where John climbed a 3000m high mountain, Bill climbed a 4000m high mountain, and Mary climbed both a 2500m high mountain and a 3500m high mountain. Here, John's mountain is 'sandwiched' between Mary's mountains so that the person who climbed the lowest mountain (i.e. Mary) also climbed a higher mountain than another climber (i.e. John). According to Sharvit & Stateva (2002: 473), speakers judge (104) as false in this scenario (provided that the context makes clear that no mountain can be ignored). But the movement theory implemented as in (104)b incorrectly predicts the sentence to be true: (103)b implies that there is a degree  $d$  such that everybody but John climbed a  $d$ -high mountain, which is the case of degrees between 3001 and 3500. The in situ theory, however, does not run into this problem because it implies comparison between mountains.

Under the assumption that *least* is decomposable into the superlative morpheme *-est* and a negation (see Rullmann 1995, Stateva 2000, Heim 2006), note that the movement theory can correctly predict the sentence to be false under the LF in (104)c as mentioned by Sharvit & Stateva (2002: 477): this LF implies that only John climbed a mountain that does not reach some degree of height; Mary's lower mountain makes it impossible to satisfy. The problem nevertheless remains that nothing seems to be able to block the alternative LF in (103)b where *-est* and the negation move simultaneously. In fact, both LFs are needed to explain the two types of upstairs *de dicto* readings with negative superlatives (Stateva 2000, Sharvit & Stateva 2002):

- (105) John wants to climb the least high mountain.
- a. John [C-least]  $\lambda d$  [want to climb [a d-high mountain]]
  - b. John [C-est]  $\lambda d$  [climbed [a not d-high mountain]]

(105)a captures the 'at least' upstairs *de dicto* reading: (105) is true under this reading e.g. in a scenario where to improve their ranking, John wants to climb a 3000m high mountain (or higher), Mary wants to climb a 4000m high mountain (or higher), and Bill wants to climb a 5000m high mountain (or higher). (105)b captures the 'at most' upstairs *de dicto* reading: (105) is true under this reading e.g. in a scenario where to remain safe, John wants to climb a mountain that is no higher than 3000m, Mary wants to climb a mountain that is no higher than 4000m, and Bill wants to climb a mountain that is no higher than 5000m.

Instead, Sharvit & Stateva (2002) propose an in situ theory that can derive all readings with negative superlatives. But it relies on treating DPs in a non-standard way (i.e. as properties) in intensional environments, thus requiring ad hoc type shifters, and complex contextual restrictions of comparison sets. Specifically, (105) is derived using the LF in (106) including the type-shifter IDENT-W\* and a crosscategorial definite article (coming with a variable  $J$

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follow from the movement theory. I agree that the PP is indeed preferably construed as the comparison set, thus yielding an absolute reading; but a relative reading seems in fact available (cf. Coppock & Beaver 2014: fn. 14) if the context favors a construal where *in Europe* is not interpreted as the comparison set, e.g. because the common ground entails that only European cities are under discussion, or because they are contrasted with other cities; such interpretations can be favored by continuations such as "his friends only visited small cities in Europe", or "Mary visited the largest city in Asia".

(xxiii) John visited the largest city in Europe.

restricting its domain as is standard), in which the DP is interpreted as a property and the verb must thus type-shift to combine with it.

(106) John wants-@ [1 [PRO to climb-w<sub>1</sub> [the-J [IDENT-W\* [2 [least [high mountain-w<sub>2</sub>]]]]]-w<sub>1</sub>]]

To obtain the ‘at least’ reading, W\* has to be contextually restricted to the set {w : for all x in {John, Bill, Mary}, x climbs the lowest mountain allowed by x’s actual needs, and the mountains that John, Bill and Mary climb in w are the only mountains in w}. To obtain the ‘at most’ reading, W\* must be contextually restricted to the set of worlds which contain three mountains only: one mountain climbed by John which is at most 3000 ft high, one mountain climbed by Mary which is above 3000 ft and at most 4000 ft high, and one mountain climbed by Bill which is above 3000 ft and at most 5000 ft.

In sum, both the movement theory and the in situ theories face problems. The movement theory seems to be redundant and make incorrect empirical prediction in some subtle cases involving ties or sandwich scenarios. Sharvit & Stateva’s version of the in situ theory seems to overcome the former problems, but at a high cost: extra and ad hoc machinery is required in intensional environments, and superlatives are not treated like comparatives. In the next section, I’ll argue that the superlative clause hypothesis is a new version of the movement theory that has several conceptual advantages and need not compromise on parsimony.

### 3.2. The elided superlative clause hypothesis

The superlative clause hypothesis implies that the domain of comparison in (94) can be expressed by an elided degree clause, in parallel to comparative clauses.

- (107) a. John wants to climb the high-est mountain (**that anyone wants to climb**).  
b. John wants to climb a high-er mountain (**than Mary wants to climb**).

It is well-known that comparative clauses can involve multiple types of ellipsis (see e.g. Lechner 2020 for a review). Although this case is hardly studied, it is also possible for the comparative clause to be fully implicit. As discussed in e.g. Charnavel (2015) for the case of comparatives and adjectives like *same/different*, sentences involving a bare comparative (e.g. *I climbed a higher mountain*) are multiply ambiguous, and this can be explained by assuming different elided types of complements crucially involving a covert underspecified element that can be interpreted deictically, anaphorically or reflexively (see *than x* below interpretable as e.g. *than this one*, *than her*, *than himself before*).<sup>37</sup>

- (108) a. Mary climbed a 1000m high mountain. I climbed a higher mountain [~~than x~~/than x climbed).  
b. As compared to last year, each climber climbed a higher mountain this year [~~than x~~ climbed].  
c. Each climber climbed a different mountain [~~than x~~ climbed].

In other words, comparatives can take fully silent clauses as complements when the standard of comparison (e.g. *Mary* in (107)b), which contrasts with the focused correlate (e.g. *John* in

<sup>37</sup> Charnavel (2015: 133-137) argues that the hypothesis of such underspecified elements is independently supported for by the behavior of relational nouns like *enemy* of *neighbor*, or the French clitic *se*.



(107)b), is a covert underspecified element (see *x* in (108)), and the rest of the sentence is elided under identity.

The superlative clause hypothesis implies that superlatives can involve similar types of ellipsis, including full elision of the clause (see section 4 for discussion of other types of ellipsis). The specificity of superlatives as compared to comparatives implies that the standard of comparison must induce computation of a set as domain of comparison. In (107)a, the silent correlate of *John* must thus correspond to a quantifier (expressible as *anyone*, cf. Howard 2014).<sup>38</sup> In fact, note that a quantifier can also stand as (overt or covert) standard of comparison in the case of comparatives.

(109) Mary climbed a 1000 m high mountain. Bill climbed a 1500 m high mountain. Lea climbed a 500 m high mountain. John climbed a higher mountain (than anyone).

(110) John climbed 3000 m, 3500 m and 3800 m high mountains in the past. He climbed a higher mountain (than ever) today!

The uniformity assumed between comparatives and superlatives thus implies that the derivation of upstairs *de dicto* readings relies on ellipsis of a clause like the bolded one in (107)a, just as the equivalent reading in comparatives relies on ellipsis of the bolded clause in (107)b. This hypothesis amounts to unpacking the lexical entry of *-est*, which in Heim's (2001: 234) terms, involves 'semantic ellipsis, and moving some of its ingredients to the syntactic representation. Beyond bringing the lexical entry of *-est* closer to that of *-er*, we will see that this hypothesis better motivates movement of *-est* (in parallel to movement of *-er*) due to the interaction it implies between ellipsis and movement.

### 3.2.1. Further motivating movement

Although – to my knowledge – its relevance to upstairs *de dicto* readings has hardly been exploited, the interaction between comparatives and intensional predicates has been much studied (see esp. Heim 2001, Bhatt & Pancheva 2004). In fact, the upstairs *de dicto* reading corresponds to one of the three readings that have been identified in comparative constructions involving intensional predicates such as (111) (see Williams 1974, Sag 1976, Heim 2000, 2001, Bhatt & Pancheva 2004, i.a.).

(111) Mary<sub>i</sub>'s father tells her<sub>i</sub> to work harder than her<sub>i</sub> boss does.  
a. Mary<sub>i</sub>'s father tells her<sub>i</sub> to work harder than her<sub>i</sub> boss does (work d-hard).

<sup>38</sup> I have so far adopted the standard lexical entry of 2-place *-est* according to which *P* denotes a set of degree properties while *Q* denotes a set thereof (see (38) or (47)). But note that we could alternatively assume that *Q* also denotes a set of degree properties as long as the standard of comparison is an existential quantifier (inducing universal quantification under the negation contributed by *-est* – which would incidentally suggest an explanation as to why it can take the overt form of a negative polarity item). This further likens the lexical entry of 2-place *-est* and that of 2-place *-er*:

(xxiv)  $\llbracket -est \rrbracket (C_{\langle d, st \rangle}) (P_{\langle d, st \rangle}) = 1$  iff  $\exists d \mid P(d)=1$  and  $\neg Q(d)=1$   
 $\llbracket -est \rrbracket (C)(P)$  is defined only if  $P \Rightarrow Q$ , and  $\exists d' \neq d \mid Q(d')=1$

Example: *P*:  $\lambda d. \lambda w.$  John climbed a *d*-high mountain in *w*

*Q*:  $\lambda d. \lambda w. \exists x \mid x$  climbed a *d*-high mountain in *w*.

To avoid contradiction in the assertion, this would require restricting the domain of quantification of the existential quantifier so as to exclude John, which can be ensured by contrastively focusing *John*. Note that the same happens in comparatives such as *John did better than anyone* (vs. *John did better than anyone else*) or *John did better than ever*.

- i. -er > tell: Mary's father tells her: "work  $d_1$ -hard"; Mary's boss works  $d_2$ -hard;  $d_1 > d_2$ .
  - ii. tell > -er: Mary's father tells her: "work harder than your boss works".
  - b. Mary<sub>i</sub>'s father tells her<sub>i</sub> to work harder than her<sub>i</sub> boss does (tell her to work  $d$ -hard)
  - i. -er > tell: Mary's father tells her: "work  $d_1$ -hard"; her boss tells her: "work  $d_2$ -hard";  $d_1 > d_2$ .
  - ii. \*tell > -er: Mary's father tells her: "work harder than your boss tells you to work".
- (Bhatt & Pancheva 2004: 30)

Here, different readings result from different possible choices of ellipsis and covert movement of the degree quantifier, which are partially interrelated. When only the lower VP is elided as in (111)a, the comparative morpheme *-er* can be interpreted above *tell*, in which case the *than*-clause must be read *de re* (see (111)a-i), or below *tell*, in which case the *than*-clause can be read *de dicto* (see (111)a-ii) or *de re* (not illustrated).<sup>39</sup> When the higher VP is elided as in (111)b, *-er* must scope over *tell* to resolve antecedent containment deletion and license ellipsis (see (112)) so that the *than*-clause must be read *de re* as in (111)b-i (Sag-Williams Ellipsis-Scope generalization).

(112) [-er than her<sub>i</sub> boss does ~~tell her<sub>i</sub> to work t-hard~~] Mary<sub>i</sub>'s father tells her<sub>i</sub> to work t hard  
 The *de dicto* reading is unavailable in (111)b-ii and can only be triggered by the less elliptical structure in (113).

(113) Mary<sub>i</sub>'s father tells her<sub>i</sub> to work harder than her<sub>i</sub> boss tells her to.  
 Crucially for our purposes, the reading in (111)b-i is the comparative counterpart of the upstairs *de dicto* reading: the measure judgment (about how hard Mary should work) is ascribed to the attitude holders (Mary's father, Mary's boss) while the comparison is made by the speaker. Similarly, the comparative counterpart of (107) in (114) exhibits a reading where only the comparison (vs. the measure judgment) is made by the speaker.

(114) John wants to climb a higher mountain than Mary does.  
 Furthermore, Heim (2001) observes that the reading in (111)a-ii and the reading in (111)b-i extend to superlatives.

(115) Mary<sub>i</sub>'s father tells her<sub>i</sub> to work (the) hardest.  
 For example, (115) can either express that Mary's father's order is comparative (what Mary is ordered to do is to work harder than others work) or that it is quantitative (what Mary is ordered to do by her father is to work a certain amount; it turns out that this amount exceeds other amounts recommended to her by other people).

Heim (2001) takes this observation as further evidence for the possibility of DegP movement above intensional predicates. According to her, the argument is clearer in the case of superlatives because they do not involve syntactic ellipsis and the argument is thus not contingent on assumptions about ellipsis licensing. But the argument can be reversed: the fact

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<sup>39</sup> The *de re* vs. *de dicto* distinction does not usually qualify the same elements in the literature on comparatives and superlatives: *de dicto* (vs. *de re*) is usually intended to characterize the DP (e.g. *the/a d-high mountain*) in the superlative literature, but the *than*-clause in the comparative literature. Furthermore, the scope of the DegP with respect to the intensional predicate is indicated using a specific term *upstairs* (vs. *downstairs*) in the superlative (vs. comparative) literature. I will henceforth stick to the superlative terminology (complementing it with the *low* vs. *high* contrast to capture differences in ellipsis size, and the degree *de re* vs. degree *de dicto* contrast to indicate DegP scope).

that similar readings occur with comparatives and superlatives arguably provides evidence for the hypothesis that they are derived in a similar fashion and that *-est* movement is motivated by ellipsis licensing (antecedent containment deletion). This is our superlative clause hypothesis according to which superlatives do in fact involve syntactic ellipsis as represented in (116).

- (116) a. Mary<sub>i</sub>'s father tells her<sub>i</sub> to work (the) hardest (~~that anyone works~~).  
 b. Mary<sub>i</sub>'s father tells her<sub>i</sub> to work (the) hardest (~~that anyone tells her to work~~).

The relative *de dicto* reading is derived by ellipsis of the lower VP as in (116)a (cf. (111)a-ii), while the upstairs *de dicto* reading is derived by ellipsis of the higher VP as in (116)b (cf. (111)b), which requires scoping *-est* above the intensional predicate

Furthermore, the facts motivating the Sag-Williams Ellipsis-Scope generalization in the case of comparatives are also observed with superlatives. Specifically, (115) does not exhibit the reading in (117), just like we saw that (111) does not display the reading in (113).

- (117) Mary<sub>i</sub>'s father tells her<sub>i</sub> to work (the) hardest that anyone tells her to.

Under Heim's (1995/1999) analysis, the absence of this reading derives from the hypothesis that the type of comparison depends on the shape of the sister of *-est*.

- (118) a. Mary<sub>i</sub>'s father tells her<sub>i</sub> [C-*est*] PRO  $\lambda d$ [to work d-hard].  
 b. Mary<sub>i</sub>'s father tells her<sub>i</sub> PRO [C-*est*]  $\lambda d$ [to work d-hard].

In (118)a based on two-place *-est* (see (38)), it is the case because C corresponds to the focus value of the sister of *-est*. In (118)b based on three-place *-est* in (36), it is the case because the relation used for comparison is created through movement of *-est* (cf. (97)a). If the degree comparison is *de dicto* as in (117), *-est* must thus remain below the intensional predicate, which implies that the domain of comparison cannot involve the intensional predicate.

Under our superlative hypothesis, the absence of the same reading as (117) in (115) derives from the same constraints on ellipsis licensing discussed for comparatives.

- (119) a. Mary<sub>i</sub>'s father tells her<sub>i</sub> [-*est* ~~that anyone works t hard~~] to work t hard.  
 b. [-*est* ~~that anyone tells her<sub>i</sub> to work t hard~~] Mary<sub>i</sub>'s father tells her<sub>i</sub> to work t hard.  
 c. \*Mary<sub>i</sub>'s father tells her<sub>i</sub> [-*est* ~~that anyone tells her<sub>i</sub> to work t hard~~] to work t hard.

When the higher VP is elided as in (119)b-c, only a degree *de re* reading obtains (i.e. the upstairs *de dicto* reading in (119)b) because *-est* must scope above *tell* to resolve antecedent containment deletion. The degree *de dicto* reading is only possible with lower VP ellipsis as in (119)a. Thus, the prediction of our superlative clause hypothesis is identical to that of Heim's movement theory. But the superlative clause hypothesis has two conceptual advantages: it extends to superlatives the explanation already needed for comparatives based on the independently motivated interaction between scope and ellipsis; it provides additional motivation for *-est* movement, which is thereby not only required for interpretive reasons, but also for reasons of ellipsis licensing. The superlative clause hypothesis thereby incorporates the advantages of the movement theory regarding island effects discussed in section 3.1.1; in fact, it doubly predicts island effects because under this hypothesis, not only is *-est* movement subject to island effects,

but also the movement of the degree operator in the elided superlative clause (just as in comparative clauses, see e.g. Kennedy 2002; cf. also Charnavel 2015 on *same/different*).<sup>40</sup> What about the reading in (111)a-i? While Heim (2001) only discusses two readings with comparatives (the degree *de re* reading with higher VP ellipsis as in (111)b-i, and the degree *de dicto* reading with lower VP ellipsis as in (111)a-ii), Bhatt & Pancheva (2004) mention as a third reading the degree *de re* reading with lower VP ellipsis, which can obtain if *-er* scopes over the intensional predicate as noted in (111)a-i. This reading is discussed based on (120) in Gawron (1995) that observes a difference between comparatives and superlatives.

- (120) a. John believes Roger Maris hit more home runs than Babe Ruth.  
b. John believes Roger Maris hit the most home runs.

Unlike (120)b, (120)a can be true if John only has a belief about the number of home runs Roger Maris hit, and does not know anything about any other baseball players. In other words, it is only in the case of comparatives (vs. superlatives) that the speaker can be responsible for the comparison between the number of home runs John believes Roger Maris hit with the actual number of home runs other baseball players hit.

Similarly, it seems that (115) lacks the degree *de re* reading with lower ellipsis, i.e. (115) is not true if Mary's father orders Mary to work a certain amount, but does not know anything about the amount of work ordered or achieved by others, and only the speaker judges this amount as higher than all other relevant amounts of work achieved.<sup>41</sup>

The absence of this reading is derived by the movement theory. As we saw above in (118), this theory predicts a strict correlation between the scope of *-est* and the type of comparison that can be made. If *-est* moves above the intensional predicate, the domain of comparison must thus involve the intensional predicate as shown in (121).

- (121) a. [C-*est*]  $\lambda d$ [Mary<sub>i</sub>'s father tells her<sub>i</sub> to work d-hard].  
b. Mary<sub>i</sub>'s father [C-*est*]  $\lambda d$ [tells her<sub>i</sub> to work d-hard].

Our superlative clause hypothesis makes the same prediction: the LF in (122) cannot satisfy the partitive definedness condition of *-est* because P ( $\lambda d. \lambda w. \text{Mary's father tells her to work d-hard}$

<sup>40</sup> More generally, *-est* movement is subject to any constraint on movement. For instance, example (xxv-a) (suggested by an anonymous reviewer) is correctly predicted to be unacceptable due to *for*-trace effects, just like (xxv-b) and (xxv-c).

- (xxv) a. \*Mary arranged for the most students to visit that anyone arranged for to visit.  
b. \*Mary arranged for more students to visit than anyone else arranged for to visit.  
c. \*How many students did Mary arrange for to visit?

<sup>41</sup> Charnavel (to appear) however claims that this reading exists, and among the speakers I consulted, a few speakers can marginally get this reading. This may be due to the fact that under some conditions, properties may be read *de re* (cf. *de qualitate* readings in Schwager 2011, see also Teodorescu 2009) as illustrated in (xxvi) from Teodorescu (2009: 73).

- (xxvi) Fred wants to eat a red tomato.

This sentence can be true (assuming that red tomatoes and juicy tomatoes are co-extensive) under a scenario where Fred is blind and all he wants to eat is a juicy tomato (but crucially, no specific one): *red* can here seemingly be read *de re* (see Schwager 2009 for a more precise discussion). It is conceivable that the superlative morpheme (e.g. *the most* in (120)) can marginally behave like *red* here (under some specific intonation).

Also note that this could also explain why *John wants to climb the highest mountain* can marginally have an absolute upstairs *de dicto* reading where all John wants to climb is any mountain that is at least 8700m high, and he does not know that only Mount Everest qualifies.

Thanks to an anonymous reviewer for bringing up *de qualitate* readings to my attention.

in *w*) does not belong to the intended *Q* ( $\{\lambda d. \lambda w. \text{ anyone works } d\text{-hard in } w\}$ ). In other words, the matching condition between the correlate clause and the domain of comparison is not satisfied (see section 2.2.1).

(122) #[-est ~~that anyone works t-hard~~] Mary<sub>i</sub>'s father tells her<sub>i</sub> to work t hard.

In sum, our hypothesis correctly predicts that the behavior of superlatives is similar to that of comparatives modulo the partitivity condition that imposes more constraints on superlatives: in principle, it implies the same possibilities on ellipsis licensing in comparatives and superlatives, but superlatives are further restricted by the required match between the correlate clause and the domain of comparison. As now represented with our original example in (123), superlatives thus display a high relative upstairs *de dicto* reading in (a) (corresponding to the high scope reading of comparatives with high ellipsis) and a low relative downstairs *de dicto* reading in (c) (corresponding to the low scope reading of comparatives with low ellipsis), but can trigger neither a low relative upstairs *de dicto* reading in (b) (corresponding to the high scope reading of comparatives with low ellipsis) due to the partitivity condition, nor a high relative downstairs *de dicto* reading in (d) (corresponding to the low scope reading of comparatives with high ellipsis) due to the Sag-Williams Ellipsis-Scope generalization; this last reading only obtains when the intensional predicate is not elided as in (124).

- (123) a. [-est ~~that anyone wants to climb a d-high mountain~~] John wants to climb a d-high mountain.  
 b. #[-est ~~that anyone climbs a d-high mountain~~] John wants to climb a d-high mountain.  
 c. John wants [-est ~~that anyone climbs a d-high mountain~~] to climb a d-high mountain.  
 d. \*John wants [-est ~~that anyone wants to climb a d-high mountain~~] to climb a d-high mountain.

(124) John wants to climb the highest mountain that anyone wants to climb.

Now recall that we originally identified five readings in sentences involving a superlative and an intensional predicate; not just the upstairs *de dicto* and relative *de dicto* readings as in (123)a and (123)c above, but also relative *de re*, absolute *de dicto* and absolute *de re* readings. We originally saw in (94) that these different readings could be assumed to derive from different scopes of the superlative DP (e.g. *the highest mountain*) with respect to the intensional predicate (e.g. above or below *want*) and different choices of comparison set (e.g. all relevant mountains vs. all relevant aspirant climbers). Absolute readings also exist in comparatives, as well as the relevant distinction between *de re* and *de dicto* readings, but this requires the comparative adjective to be attributive as in (125): if the intended complement of the comparative is a phrase denoting a mountain (e.g. Mont Blanc), the equivalents of both absolute *de re* and *de dicto* as well as relative *de re* readings are available.

(125) John wants to climb a higher mountain (than Mont Blanc/than Mary does).

Note that under 2-place *-er* and *-est* hypotheses, absolute readings can be captured in a similar way to relative readings by scoping *-er* or *-est* within the NP (cf. Romero 2011) and assuming ellipsis of reduced predicative clauses (cf. Charnavel 2015: 160).

- (126) a. John wants to climb a higher mountain than Mont Blanc (is).  
 b. John wants to climb a  $\lambda y$  -er y d-high mountain than Mont Blanc (is) ~~d-high mountain~~

- (127) a. John wants to climb the highest mountain (that there is).  
 b. John wants to climb the  $\lambda y$  -est y d-high mountain ~~that x (is) d-high mountain~~

Further note that in parallel to the case in (122), the matching condition of superlatives precludes two further readings that are exhibited by the comparative (i.e. absolute upstairs *de dicto* and low relative upstairs *de re*). First, (126)a can express a comparison between the climbing ambitions of John (in terms of height, but not targeting any specific mountain) and the actual height of Mont Blanc; (127)a does not have the corresponding reading (or only marginally, see fn. 41), because the superlative clause must match the correlate to satisfy the partitive condition. Similarly, *John wants to climb a higher mountain than Mary did* can express a comparison between the climbing ambitions of John in terms of a specific mountain and the actual climbing achievement of Mary; *John wants to climb the highest mountain* does not have the corresponding reading for the same reason.

In sum, the combination of the three comparison set possibilities (i.e. the type of (elided) comparative or superlative clauses under our hypothesis) and the three relative scope possibilities of Deg -er or -est, NP and V (the scope NP > V > Deg being independently excluded by the meaning of Deg) yields 9 logical possibilities out of which 5 readings are available for superlatives in the absence of overt domain of comparison:<sup>42</sup> as we saw, 3 readings are excluded by the partitive condition on superlatives (vs. comparatives) and one by the Williams-Sag scope generalization.

Superlatives (with covert superlative clause)	Comparatives	Scope	Comparison set
absolute (upstairs) <i>de re</i>	high DegP scope, phrasal, specific.	DP > V	DP (e.g. {that there/than Mont Blanc} is a d-high mountain)
absolute (downstairs) <i>de dicto</i>	low DegP scope, phrasal	V > DP	
#absolute upstairs <i>de dicto</i>	high DegP scope, phrasal, non specific	-Deg > V > NP	
(high) relative (upstairs) <i>de re</i>	high DegP scope, high ellipsis	DP > V	high VP (e.g. {that anyone/than Mary} wants to climb a d-high mountain)
*(high) relative (downstairs) <i>de dicto</i>	low DegP scope, low ellipsis	V > DP	
(high relative) upstairs <i>de dicto</i>	high DegP scope, high ellipsis	-Deg > V > NP	
#low relative upstairs <i>de re</i>	high DegP scope, low ellipsis	DP > V	low VP (e.g. {that anyone/than Mary} climbs a d-high mountain)
(low) relative (downstairs) <i>de dicto</i>	low DegP scope, low ellipsis	V > DP	
#low (relative) upstairs <i>de dicto</i>	high DegP scope, low ellipsis	-Deg > V > NP	

Table 3. Relevant readings triggered by comparative and superlatives complementing intensional predicates (e.g. *John wants to climb the highest mountain*) under the superlative clause hypothesis

<sup>42</sup> There are even more readings if we take into account the *de re* vs. *de dicto* distinction in the comparison set (comparative/superlative clauses can be *de re* or *de dicto* under low scope of DegP), *de qualitate* readings (see fn. 41) and the distinction between *de dicto* and *de credito* readings (see e.g. Yanovitch 2011).

The superlative clause hypothesis can thus be seen as a more parsimonious version of the movement theory in the sense that it treats comparatives and superlatives in a more parallel fashion (while integrating their intrinsic difference relative to partitivity), thus further motivating *-est* movement (for ellipsis licensing). By equating the comparison domain with a (elided) clause, it also eliminates some redundancy in the theory. First, the partitive condition is expressed both in the definition of *-est* and in the focus conditions in Heim's 1995/1999 theory (see fn. 12); by hypothesizing that the comparison set is not expressed by focus alternatives but by a clause, the partitive condition is only expressed once. Second, the superlative clause hypothesis suggests a way to treat absolute and relative readings uniformly (by adjusting the elided clause), thus eliminating redundant LFs (see (103)). That said, LFs for absolute and relative readings further differ in definiteness, which seems to remain an issue for the movement theory. In the next and last section, we nevertheless show that definiteness does not provide an argument for in situ against movement theories.

### 3.2.2. The definiteness issues

Recall that under the movement theory, LFs in which *-est* moves out of the DP to yield relative readings require an indefinite article (for both semantic and syntactic reasons), unlike LFs in which *-est* remains within the DP (see e.g. (103)). This raises several questions that seem to undermine the movement theory: how can a definite article turn into an indefinite article after movement? How can it make the correct predictions in cases of ties or sandwich scenarios? First, it is important to note that as Szabolcsi (1986) observes, indefiniteness effects are independently supported: superlatives can appear in environments licensing only indefinites such as existential constructions in (128) under relative (vs. absolute) readings:

- (128) a. Who did you take the \*(best) picture of?  
       b. JOHN has the \*(smartest) sister.  
       c. There were the \*(fewest) guests YESTERDAY. (Szabolcsi 1986)

These effects are thus consistent with the movement theory and cannot be explained under the in situ theory. In fact, Sharvit & Stateva (2002: 486), which argue for an in situ theory, also assume that the definite determiner can be replaced by the indefinite determiner. But it remains to explain why *-est* movement seems to turn the definite determiner into an indefinite instead of yielding ungrammaticality.

To solve this problem, I hypothesize – inspired by Krasikova 2012 and Loccioni 2018, i.a. – that the overt definite article in superlatives (cf. also *only*, see Sharvit 2015, i.a.) need not mark definiteness of individuals. This is empirically supported by languages like French that can exhibit two definite articles (e.g. *la montagne la plus haute*, lit. ‘the mountain the highest’, cf. fn. 13) and that can show mismatch in agreement between the definite article and the superlative adjective (e.g. *c’est parmi ses compagnes d’enfance qu’elle est le plus heureuse* ‘it is among her childhood friends that she is the\_MASC most happy\_FEM’, Silberlight 1965). Conceptually, this further suggests a way of compositionally building the superlative on the comparative as hinted by morphology in languages after languages (see Bobaljik 2012). Recall that the only differences between 2-place *-er* and 2-place *-est* are the partitive condition in superlatives and the type of domain of comparison, which instead of containing just one element of comparison, contains all relevant elements of comparison. Following Krasikova (2012), I would like to

suggest that the latter information is contributed by the (uniqueness presupposition of the) definite article (whose existential presupposition further indicates that the domain of comparison is not empty), which thus does not head a DP, but a DegP. Under this hypothesis, *-est* does not move out of a definite DP or violate islands to yield relative readings.

Although I will have to leave the details of this hypothesis for future research, we can more concretely assume that *the highest mountain* is ambiguous between *the -est a high mountain* and *the -est the high mountain* (which presumably does not give rise to redundancy due to maximize presupposition) and it is the complex quantifier *the -est* that can move. This seems to further correctly predict some subtle judgments in case of ties (see (103)). Remember that if John climbed two 4000m high mountains and all other relevant climbers reached lower summits, *JOHN climbed the highest mountain* is predicted to be neither true nor false under the in situ theory, but plainly true under the movement theory, while the judgments are usually reported to be unclear, and thus more in line with the predictions of the in situ theory. But assuming that the DP (vs. DegP) can in fact be definite or indefinite under the movement theory, we correctly predict truth (under the indefinite construal) or indeterminacy (under the definite construal), which may explain the variety in judgments. That said, it remains to explain why some speakers do consider the definite construal here but do not seem to do so in intensional contexts (where there is usually no single target element in the alternative worlds). As far as I can see, this question subsists in some form or other under all theories (for instance, Sharvit & Stateva have to assume that the definite can be replaced with the indefinite determiner in intensional contexts).

Under the scenario with tie between climbers (both John and Bill climbed the same 4000m mountain which is higher than the summits reached by the other relevant climber), recall that the movement theory predicts falsity, but the in situ theory predicts truth, while the actual judgments are unclear and vary depending on specific examples. This suggests that this reading can obtain under two construals of the domain of comparison (i.e. the relative construal *the highest mountain that anyone climbed*) or the absolute construal *the highest mountain that there is* with contextual restriction to the mountains climbed).<sup>43</sup> To fully explain the variety in judgments, it remains to explain why for some speakers or/and in some examples, one LF is chosen over the other, which I have to leave for future research. But crucially, the movement theory, which overgenerates in some cases, fares better than the in situ theory, which fatally undergenerates.<sup>44</sup>

The same holds in the last problematic case discussed regarding definiteness, namely sandwich scenarios as in (104) (*John climbed the least high mountain*). Recall that if John climbed a 3000m high mountain while Mary climbed a 2500m and a 3500m high mountain, (104) is wrongly predicted to be true under one of the two LFs generated by the movement theory (the

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<sup>43</sup> Under the analysis of the absolute reading that we suggest (with two-place *-est* scoping within the NP as in (127)), both the definite and the indefinite construal yield the same truth and definiteness conditions. By maximize presupposition, the definite construal is thus chosen. But the availability of the indefinite construal is necessary under syntactic conditions that do not license a definite article. For example, Sharvit & Stateva observe that *who did you sell the most expensive picture of?* does have an absolute reading, thus arguing against the strict correlation between indefiniteness and comparative readings proposed by Szabolcsi (1986). This is correctly predicted by our hypothesis.

<sup>44</sup> For example, the felicity of Heim's 1995/1999 German example *Wenn niemand eindeutig den höchsten Berg besteigt, wird der Preis nicht vergeben* (lit. if nobody unambiguously the highest mountain climbs is the prize not awarded) remains unexplained under the in situ theory.



LF moving both the negation and *-est* above the VP) while the other LF where only *-est* moves as well as the in situ theory correctly predict the sentence to be false. However, the in situ theory requires extra and ad hoc machinery in intensional environments as in (105) (*John wants to climb the least high mountain*), while the two LFs licensed by the movement theory directly derive the two available readings. Furthermore, Buring (2007) observes that unlike the movement theory, the in situ theory undergenerates in similar cases with comparatives. First, observe that in the same scenario as (104), (129) is judged false.

(129) John climbed a less high mountain than Mary (did).

Both the movement theory (under the LF with split scope of *-est* and negation) and the in situ theory (relying on comparison between mountains, not heights) correctly predict (129) to be false.<sup>45</sup> But Buring shows that the same in situ theory makes wrong predictions in cases where the *than*-clause contains an intensional predicate: for instance, it wrongly predicts the truth conditions of (130) to be as in (b).<sup>46</sup>

- (130) You bought a more expensive house than I thought you would.
- a. you bought a house which is d-expensive, and I didn't think you'd buy a d-expensive house.
  - b. \*you bought a house which is more expensive than any house I thought you'd buy

On the contrary, the movement theory makes the correct prediction as in (130)a and it further correctly predicts that (131) has two readings depending on the scope of the negation.

- (131) He bought a less expensive car than he could have (ten years ago).
- a. '(for some price) he bought a car that inexpensive, and (ten years ago) he couldn't have bought a car that inexpensive (he used to have to spend more money)' 'less than any'
  - b. '(for some price), he bought a car that wasn't that expensive, and he could have bought a car that expensive (he's modest)' 'less than some'

In sum, the in situ theory (based on individual comparison) can easily capture sandwich scenarios in both superlatives and comparatives, but crucially undergenerates some readings

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<sup>45</sup> Sharvit & Stateva (2002: 501) claim that the judgments for comparatives in sandwich scenarios are unclear based on the following sentence (in a scenario where Mary's mountain is sandwiched between John's mountains in terms of slipperiness):

(xxvii) Mary climbed a less slippery mountain than John climbed.

Buring (2007) attributes the unclarity of judgments to the pragmatic oddness of their example, and instead uses the following example (in a scenario where Bob's method is sandwiched between Mary's methods in terms of expensiveness):

(xxviii) Bob knows a less expensive method than Mary.

This suggests that the pragmatic orientation of the scale may matter (as in stereotypical context, it's better to know the least expensive method, but to climb the most slippery mountain).

<sup>46</sup> Partly due to the uncertainty of their judgments in sandwich scenarios (see fn. 45), Sharvit & Stateva (2002) do not extend their semantics of superlatives to comparatives: in particular, they treat the *than*-clause as a set of degrees, while they treat the domain of comparison for superlatives as a set of individuals. As mentioned by Buring (2007: fn. 3), it remains to be seen if Sharvit & Stateva's solution for upstairs *de dicto* readings could extend to cases like (130). They do not explore it in their paper given that they treat *than*-clauses as set of degrees (vs. individuals) since their judgments in sandwich scenarios do not provide a motivation for treating them as individuals (fn. 45).

with intensional predicates (or requires extra and ad hoc machinery to generate them). Instead, the movement theory easily captures these readings, and only overgenerates in sandwich scenarios. We thus reach the same outcome for all tricky cases involving definiteness: the movement theory definitely fares better than the in situ theory, which fatally undergenerates. Under the movement theory, it only remains to understand why some predicted readings are unattested, which will probably require clarifying independent scope constraints with intensional predicates.<sup>47</sup> As with previous points discussed in previous section, the superlative clause hypothesis, which builds on the movement theory, thus incorporates all its advantages as compared to the in situ theory. It further exhibits conceptual advantages by making superlatives parallel to comparatives and providing further motivation for *-est* movement.

#### 4. Conclusion and prospects for further research

To conclude, both the case of intensional superlatives and that of upstairs *de dicto* readings provide support for the superlative clause analysis. The hypothesis that the domain of comparison can be syntactically represented by a degree clause derives the correct range of readings and the properties associated with them in both cases. In particular, it crucially entails the possibility of splitting the scope of the superlative morpheme and the measuring relation across intensional predicates, thus overcoming undergeneration problems of previous theories. At the same time, it implies specific constraints on the construal of the comparison domain due to degree quantification, which also avoids their overgeneration problems. Furthermore, the superlative clause hypothesis exclusively relies on independently motivated ingredients drawing from the theories of degree quantification, ellipsis and scope.

One conspicuous argument has nevertheless recently been provided which could potentially challenge the empirical adequacy of the superlative clause hypothesis. Bumford & Sharvit (2022) observe that NPIs can be licensed outside superlative noun phrases as illustrated in (132).

- (132) a. The judge who gave the highest score to any rookie later regretted it.  
 b. Economics is the field in which the fewest women have ever won a Nobel Prize.  
 c. John has donated the most money to any third-party candidate.

In these sentences, the NPIs are available only in the presence of a superlative and only under relative readings. Nevertheless, they do not occur in the restrictor of *-est*, even assuming ellipsis of the superlative clause.

- (133) a. The judge who gave the highest score [~~that any judge gave to any rookie~~] to any rookie later regretted it.  
 b. Economics is the field in which the fewest women [~~that have ever won a Nobel Prize in any field~~] have ever won a Nobel Prize.  
 c. John has donated the most money [~~that anyone has donated to any third party candidate~~] to any third-party candidate.

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<sup>47</sup> Sharvit & Stateva (2002) claim that the scope option where both negation and *-est* move, which is required to generate the ‘at least’ reading with intensional predicates (see (105)), overgenerates a reading in sandwich scenarios. We could instead wonder why the negation can move above the intensional predicate in (105), which may relate to neg-raising issues.

Contrary to what Bumford & Sharvit (2022: 270) claim, these NPIs are part of the comparison class: for example, the comparison in (133)a is not just between judges, but between pairs of judges and rookies; in fact, the NPIs do appear in the elided superlative clauses in (133). But their point remains that the overt NPIs occur outside it,<sup>48</sup> which seems to challenge the predictions of our theory.

But there is an alternative hypothesis consistent with the superlative hypothesis, which consists in assuming the presence of a higher implicit operator licensing NPIs in the presence of the superlatives. Several observations motivate this hypothesis. First, in all examples mentioned by Bumford & Sharvit (2022), the main variable element in the comparison class (e.g. the judge in (133)a) is expressed as the definite head of a relative clause (as in (133)a,c), as focused (as in (133)b) or as questioned (see Bumford & Sharvit 2022: 270); this is expected under the assumption that they are associated with a focus operator. Second, there is a rich literature independently demonstrating the need for covert focus operators (i.e. *only* and *even*, see e.g. Krifka 1995, Chierchia 2013) to license NPIs. Third, all examples not only require the superlative, but also a specific choice of predicates to license NPIs as we will see. All this suggests that the NPIs in examples (133) are licensed by a covert *even* E (also associating with the main element of comparison) as illustrated in (134); the superlative does not directly license them, although it plays a crucial role.

(134) E [JOHN<sub>F</sub> has donated the \*(most) money to **any**<sub>F</sub> third-party candidate]

Specifically, the superlative changes the monotonicity of the environment hosting the NPI: while it is upward entailing in its absence ((135)b entails (135)a), it becomes non-monotone in its presence, crucially only under a relative reading ((136)b does not entail (136)a, nor does (136)a entail (136)b).

(135) a. John has donated the money to a third-party candidate.

b. John has donated the money to a reasonable third-party candidate.

(136) a. John has donated the most money (that anyone gave) to a third-party candidate.

b. John has donated the most money (that anyone gave) to a reasonable third-party candidate.

As has been shown by e.g. Crnić (2014), NPIs can be licensed in non-monotone environments as long as the context of the sentence allows the presence of covert *even*, namely if alternatives are construed as more likely or expected, as required by *even*. The superlative also plays a crucial role in this respect by evoking the end of a scale, which interacts with the rest of the sentence to yield unexpectedness or scandalous effects (cf. Charnavel 2016). This point is easier to see in (133)b than (133)c where John's characteristics are unspecified in the lack of context. In (133)b (repeated below as (137)a), the unexpectedness arises from the combination of a low point induced by the superlative and the rest of the sentence creating an appropriate context (i.e. yielding the underlying message that women are wronged because it would be expected that

<sup>48</sup> In (133)a,c, we may assume right node raising just as can be the case in comparative clauses. Under Lechner's (2004: 143) analysis combining right node raising with gapping, the overt NPI would be in the comparative clause, thus in the restrictor of the comparative morpheme as shown in (xxix).

(xxix) John has donated more money to ~~any third-party candidate~~ [than you have donated to any third party candidate].

But this implies for (133)a,c the availability of gapping with superlative clauses, which is argued against later on in the main text. Furthermore, this analysis is unapplicable to example (133)b.

they benefit from the same prestige as men – e.g. by winning a prestigious Nobel Prize); this is evidenced by the contrast with (137)b and (137)c where either the superlative or the predicate have been changed, thus yielding infelicity.

- (137) a. Economics is the field in which the fewest women have ever won a Nobel Prize.  
 b. Economics is the field in which the most women have (~~#ever~~) won a Nobel Prize.  
 c. Economics is the field in which the fewest women have (~~#ever~~) been harassed.

Further work is required to explain in detail all cases of NPIs appearing to arise outside the restriction of the superlative morpheme. But this preliminary investigation suggests that after all, such data do not necessarily challenge the empirical adequacy of the superlative clause hypothesis.<sup>49</sup>

Furthermore, it is not only in terms of empirical predictions, but also in terms of parsimony that the superlative clause hypothesis compares favorably to previous analyses by bringing closer the analyses of comparative and superlative constructions, which usually remain largely disconnected despite clear morphosyntactic similarities. Specifically, the hypothesis that comparative clauses have superlative counterparts opens the possibility of a unified theory of comparandum construal (cf. Gawron 1995) relying on degree clauses elidable to various extents. In this article, we have only argued that superlative clauses are attested at least in some cases. A stronger case for unification would require a systematic comparison of all possible types of comparandum in comparative and superlative constructions, which goes beyond the scope of this article. But I would like to conclude on a promising note in this respect by sketching how two conspicuous cases of apparent discrepancies between comparative and superlative clauses can in fact be derived from independent differences between comparatives and superlatives.

We started by mentioning in (1) that comparative clauses can take different forms. In particular, two cases remain notoriously debated in the literature on comparatives: comparative subdeletion as in (138)a (repeating (1)b) and comparative ellipsis as in (138)b (repeating (2)a).

- (138) a. The table is longer than the door is large.  
 b. Ann is taller than Ben.

In comparative subdeletion (vs. comparative deletion), only the degree variable is covert, the degree predicate (e.g. *large* in (138)a) remains overt (see Lechner & Corver 2017 for a review). In comparative ellipsis (cf. phrasal comparatives), the comparative clause contains only a remnant (e.g. *Ben* in (138)b), which contrasts with a correlate in the matrix clause (e.g. *Ann* in (138)b) (see Lechner 2020 for a review). Strikingly, neither case seems to have a superlative counterpart as shown in (139).

- (139) a. This table is the longest that any table is (\*large).  
 b. Ann is the tallest that anybody \*(is).

At first glance, this observation seems to challenge the superlative clause hypothesis under which we expect comparative and superlative clauses to be subject to the same types of ellipsis processes. But on closer scrutiny, this discrepancy between comparatives and superlatives – I'd

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<sup>49</sup> Furthermore, note that the alternative theory advocated by Bumford & Sharvit (2022) to derive these facts does not derive upstairs *de dicto* readings (as they acknowledge), which is a clear lack of empirical adequacy. See also fn. 26.

like to suggest – derives from their intrinsic difference, namely from the partitive condition on superlatives (vs. comparatives).

This is easiest to see in the case of subdeletion. Given the non-identity between *long* and *large*, the definedness condition requiring that the correlate P belong to (and thus match) the set of comparison Q is not satisfied.<sup>50</sup> Subsuperlatives are thus unavailable because they violate the partitive condition on superlatives.

The argument is more indirect in the case of comparative/superlative ellipsis. In a nutshell, it has been shown that comparative ellipsis, just like comparative subdeletion, obligatorily exhibits coordinate-like properties, unlike other types of comparatives that only optionally do so (Corver 1993, Lechner 2001, i.a.). The exact reason why these structures require a coordinate parse remains debated, but it seems reasonable to tie this possibility to the relational nature of comparatives, i.e. comparatives relate two distinct elements. On the contrary, superlatives, which are partitive, cannot arguably have a coordinate parse, thus explaining the ungrammaticality of superlative ellipsis.

Specifically, Lechner (2001, 2004, 2020) provides several arguments showing that comparative ellipsis is not a specific ellipsis process, but results from the combination of comparative deletion (which he analyzes as head raising) and gapping, which crucially requires a coordinate parse. To give a single example for space reasons (see other arguments in Lechner 2001, 2004, 2020), comparative ellipsis structures, just like gapping structures, are constrained by isomorphism: the antecedent and the gap have to be embedded at the same depth inside their respective conjuncts as illustrated in (140) for gapping and (141) for comparative ellipsis; (142) further shows that the same holds of partially reduced comparative clauses, thus corroborating that (141) is derived by gapping (vs. direct analysis mentioned in the introduction).

(140) The girls want to visit Sam and the boys [~~\*(want to) visit~~] Otto.

(141) More girls want to visit Sam than [~~\*(want to) visit~~] Otto.

(142) More girls want to visit Sam on Monday than [~~\*(want to) visit~~] Otto on Friday.

Strikingly, the same kinds of arguments have been provided by Corver (1993), among others, about subcomparatives. For instance, the contrast between (143)a and (143)b shows that subcomparative deletion requires a parallel, coordinate-like configuration, while that between (143)a and (143)c shows that comparative deletion does not.

(143) a. \*John gave more books than he had given pencils to Sue to his best friend Peter.

b. John gave more books to his best friend Peter than he had given pencils to Sue.

c. John gave more books than he had given to Sue to his best friend Peter.

(Corver 1993: 779-780)

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<sup>50</sup> An alternative hypothesis could also seem to derive the absence of subsuperlatives. Comparative subdeletion seems to be precluded with attributive (vs. predicative) comparatives as illustrated in (xxx) (cf. Grimshaw 1987, Izvorski 1995).

(xxx) \*Bill is a more successful actor than he is a talented director.

The unavailability of subsuperlatives could thus be argued to follow from the attributive nature of superlatives. But Loccioni (2019) (pace Matushansky 2008, i.a.) argues that superlatives can in fact be predicative (i.e. not embed a nominal projection) based on interpretive effects such as (xxxi) in English and agreement facts in Romance languages (see Silberlight's case in section 3.2.2).

(xxxi) Mary was the prettiest (#one) yesterday.

i.e. Mary was prettier yesterday than on any other relevant day.

Mismatch evidence has already shown that subsuperlatives violate the partitive condition on superlatives. I further suggest that the requirement of a coordinate parse provides the same argument, thus showing that both subsuperlatives and superlative ellipsis violate the partitivity condition.<sup>51</sup> The incompatibility of a coordinate parse with superlatives may be due to the independent fact that entailment of a conjunct by the other is generally banned. Specifically, Hurford's (1974) constraint has been shown to extend from disjunction to conjunctions (Katzir & Singh 2014, i.a.): for example, the conjunction in (144) is odd because the second conjunct entails the first one.

(144) #John lives in Paris and (he lives) in France.

Crucially, parsing a superlative as a conjunction would yield the same type of infelicity because of the partitive nature of superlatives as sketched in (145) (which purposely remains unspecified with respect to the contribution of *-est*).<sup>52</sup>

(145) a. Ann is the tallest that anyone is.  
b. #...Ann is d-tall and everyone is d-tall.

Due to their relational nature, comparatives, however, can perfectly be expressed as involving a conjunction as shown in (146).

(146) a. Ann is taller than Bill is.  
b. ...Ann is d-tall and Bill is d-tall.

This unavailability of a coordination parse in superlatives vs. comparatives can thus explain why unlike comparatives, ellipsis processes restricted to coordination structures cannot target superlatives. In fact, gapping and pseudogapping are also ruled out in superlatives unlike in comparatives:<sup>53</sup>

<sup>51</sup> This hypothesis also predicts that superlative clauses cannot be extraposed. It has been observed by e.g. Lechner (2001) or Lechner & Corver (2017) that comparative clauses exhibit coordinate-like properties when they are extraposed, thus allowing comparative ellipsis or comparative subdeletion.

(xxxii) a. More people bought magazines than (bought) books. (Lechner 2001: 701)  
b. More people than \*(bought) books bought magazines.

Under the hypothesis that the absence of superlative ellipsis and subsuperlatives is due to the impossibility of coordinate parses in superlatives, we expect extraposed superlative clauses to be ruled out. This seems to be borne out:

(xxxiii) a. The most people that bought anything bought books.  
b. \*The most people bought books that bought anything.

Cf. Hulsey & Sauerland's (2006) observation that relative clauses under the low reading of intensional superlatives disallow extraposition (see fn. 28).

<sup>52</sup> It is worth noting that all lexical entries of *-est* involve a coordination between the complement of *-est* and the domain of comparison. They nevertheless avoid this effect (or the reverse effect, i.e. contradiction, due to the negation of the second conjunct) by explicitly excluding the member of the first conjunct from the domain of comparison (see e.g. (38) repeated below).

(xxxiv)  $\llbracket -est \rrbracket (C_{\langle dt, t \rangle})(P_{\langle dt \rangle}) = 1$  iff  $\exists d \mid P(d)=1$  and  $\forall Q \mid C(Q)=1$  and  $Q \neq P, Q(d)=0$

In other words, *Ann is (the) tallest (that anyone is)* is de facto analyzed as *Ann is taller than anyone else* (but see discussion in fn. 38 for an alternative analysis). Furthermore (and crucially for this alternative analysis), Hurford's constraint does not presumably apply to metalanguage as it arguably relies on pragmatics.

<sup>53</sup> (147) and (148) avoid extraposition of superlative clauses (see fn. 51), and they do not involve attributive superlatives because attributive comparatives exhibit independent constraints on left branch extraction preventing comparative deletion as in (xxxv) (see fn. 50 on subcomparatives), which could presumably independently affect gapping and pseudogapping with both attributive comparatives and superlatives.

(xxxv) \*Pico wrote a more interesting novel than Brio wrote a play. (Kennedy & Merchant 2002: 92)

- (147) a. On Monday Ann was the happiest that anybody ever \*(was).  
       b. Ann was happier on Monday than Bill (was) on Tuesday.  
 (148) a. Ann visited Berlin the most often that anybody ever did \*(visit) any city.  
       b. [(1)d] Ann visited Berlin more often than Cleo did Dubai.

In sum, two facts that could appear to challenge the hypothesized parallel between comparative and superlative clauses in fact promise to be accounted for by independent differences between comparatives and superlatives. This supports our hypothesis that the comparandum can be expressed in the same way in comparative and superlative constructions modulo their intrinsic semantic differences. To what exact extent this hypothesis can be generalized to all cases beyond the cases of intensional superlatives and upstairs *de dicto* readings must nevertheless be left for future research as it will require a systematic exploration of many other issues that cannot be addressed within the limits of this paper. But the hope is that the few cases examined systematically in this article will motivate further research testing the underlying general hypothesis that comparative clauses have superlative counterparts, which promises to bring closer together the syntax/semantics of comparatives and superlatives.

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Nevertheless, note that Kennedy & Merchant (2002) claim that gapping and pseudogapping (vs comparative deletion) are in fact licensed with attributive comparatives.

(xxxvi) Pico wrote a more interesting novel than Brio a play. (Kennedy & Merchant 2002: 98)

(xxxvii) Pico wrote a more interesting novel than he did a play. (Kennedy & Merchant 2002: 98)

The same does not hold of superlatives, which corroborates our hypothesis:

(xxxviii) \*Pico wrote the most interesting novel that anybody (did) a book.

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