

A Quantificational-Determiner Analysis of EST in Relative Superlatives

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Abstract The goal of this paper is to reconcile the definite marking with the indefinite-like semantics of those superlatives that take a relative/comparative reading. Following Szabolcsi's and Heim's works, we will assume that the difference between absolute and relative readings of superlatives is represented at the syntactic level of semantic representation, LF (Logical Form). We will however depart from Heim's hypothesis that what raises at LF is the superlative operator itself (EST). We will instead assume a quantificational-determiner analysis of EST, which involves two raising operations at LF: EST-raising to Spec, DP and raising of the whole superlative DP (Determiner Phrase) to a scope position in the sentence. We will examine the relative readings of quality superlatives. The generalizations and the proposed analysis are not assumed to extend to quantity superlatives.

Keywords Superlatives. Definiteness. Parasitic scope. Degree words. Comparison classe.

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1 Relative Superlatives Have Indefinite-like Semantics

Superlative DPs are ambiguous between an absolute and a relative reading.¹ The relative reading is facilitated by focal stress on *John*:

- (1) John read the longest book.
 - a. J read a book that was longer than any other out of a contextually given set of books.
 - b. There was a book read by J that was longer than any other book that was read.

In this section we first present Szabolcsi's (1986) evidence in favor of the indefinite nature of relative superlatives and then we review Coppock and Beaver's (2014) arguments that the data point to indeterminate reference rather than to indefiniteness. These authors, as well as most of the other theorists of relative superlatives assume a uniform analysis of quality and quantity superlatives. We believe instead that these two types of superlatives should be kept distinct (see Dobrovie-Sorin 2021). The present paper is concerned only with quality superlatives. Unless explicitly mentioned, the descriptive generalizations as well as our proposal do not extend to quantity superlatives.

1.1 Testing (in)definiteness

Szabolcsi (1986) observed that relative superlatives pattern with indefinites with respect to several tests claimed to distinguish between definite and indefinite noun phrases.

Thus, whereas *wh*-extraction out of definite DPs is blocked in the general case, it is allowed out of superlative DPs:

- (2) a. *Who did you take the picture of?
b. Who did you take the best picture of?

There-sentences are another configuration in which indefinites are allowed, in contrast to definites. And again, superlatives behave on a par with indefinites:

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1 This reading is referred to as 'comparative' in Szabolcsi (1986), Heim (1999), Krasikova (2012), a.o. We use the term 'relative', which first appeared in the last part of Heim's (1999) seminal paper and is predominant in recent work (see, among others, Pancheva, Tomaszewicz 2012; Coppock, Beaver 2014; Bumford, Sharvit 2022). We avoid the term 'comparative' because all superlatives involve comparison and, moreover, this term could inappropriately be understood as referring to those superlatives that are morphosyntactically built on comparatives (Romance languages, Arabic, Celtic, among others).

- (3) a. There were the fewest guests YESTERDAY.
b. ??There were the guests yesterday.
c. There was the largest box of chocolate on the table YESTERDAY.
'There was a larger box of chocolate on the table yesterday than on any other day'.
d. When was there the largest box of chocolate on the table?
e. ??Yesterday there was the box of chocolate on the table.

Another indefiniteness context is the object position of I-level *have*, especially when it takes relational nouns:

- (4) a. Who has the smartest sister?
b. *Who has the sister?
c. Who has a sister?

1.2 Testing (in)determinacy

The aim of this section is to show that relative superlative DPs may benefit from an analysis in terms of indeterminacy of reference instead of indefiniteness.

Coppock and Beaver (2014) propose an analysis of relative superlatives set against the background of their theory of definiteness, according to which definite DPs necessarily presuppose uniqueness but allow for either 'determinate' or 'indeterminate' reference:

- (5) a. Definite DPs presuppose uniqueness.
b. Indeterminate reference: the DP does not presuppose existence, but denotes an existential generalized quantifier (type $\langle e, et \rangle$) (as opposed to DPs with determinate reference, which introduce the iota operator) (179).
c. Relative superlatives are definite (presuppose uniqueness) but indeterminate DPs.

Given this proposal, Szabolcsi's (1986) evidence is not evidence in favor of indefiniteness but rather evidence in favor of indeterminacy. Supporting evidence comes from Le Bruyn, de Swart, Zwarts (2013), who observed that relational *have* can co-occur with definite DPs built with *only*:

- (6) Mary has the only lazy sister.

Coppock and Beaver (2014) further observe that I-level *have* is compatible with other definite DPs:

- (7) a. Mary has the wrong boyfriend.
b. Mary has the nicer car. (OK I-level – *have*)

b'. Mary has the car. (only S-level – 'use the car')

Coppock and Beaver also point out that relative superlatives in opaque contexts (e.g. in the scope of a modal) do not provide good antecedents for anaphoric pronouns (see (8)a) nor for appositive relatives (see (9)a), in contrast to absolute superlatives and other definite DPs (in the following examples, *out of*-phrases force a relative reading):

- (8) a. #Perhaps Gloria climbed the highest mountain out of all of her friends. The prize is a picture of it.
b. Perhaps Sue climbed the highest/snow-capped mountains. I took a picture of them.
- (9) a. #You win if **out of all the players**, you lift the heaviest weight, which is this one.
b. You win if you lift the heaviest weight, which is this one.

The fact that relative superlatives in the scope of a modal do not introduce a particular referent is also shown in the following contrast involving VP-anaphoric *so*:

- (10) a. Sue wanted to see the most famous marble statue **out of all of her friends**, and so did John. #Therefore Sue and John wanted to see the same statues.
b. Sue wanted to see the most famous marble statue **in the city**, and so did John. Therefore Sue and John wanted to see the same statues.

In sum, Coppock and Beaver's main point is that Szabolcsi's evidence does not plead in favor of indefiniteness but rather in favor of a particular type of definite, an indeterminate definite.

2 Previous Proposals

2.1 The LF-raising analysis

According to Szabolcsi (1986),

- (11) Relative superlative DPs
a. are base-generated as indefinite DPs and
b. can only be interpreted if EST takes scope over an open proposition.

The open proposition is obtained by raising another element (let's call it 'correlate', following Farkas, Kiss 2000), which is either focused or *wh*-moved. The open proposition resulting from LF-raising of the correlate specifies the relation (called 'frame of comparison' by

Szabolcsi) between the compared entity and the correlate. Comparative readings thus vary depending on the focused/wh-moved element:

- (12) a. Who_i [_{e_i} gave the longest book to John]?
 b. To whom_i did [_{Mary} give the longest book e_i]?

In (12)a, the superlative needs to pick up the longest out of the books that various people gave to John, whereas in (12)b we need to consider the books that Mary gave to various people. In order to take scope over the open proposition, the superlative itself must raise at LF.

Going back to the assumption in (11)a, it is on the one hand needed in order to account for the grammaticality of examples such as (2) b (*wh*-movement is normally blocked out of definite DPs) and on the other hand motivated by the indefinite-like behavior of relative superlatives (see Section 1).

Szabolcsi's proposal is summarized in (13), corresponding to her (40):

- (13) The derivation of the comparative reading involves LF-movement: the whole superlative NP, or the *the -est* part of it, is adjoined to INFL.

Szabolcsi does not formally implement the semantic part of her analysis, and she does not choose between the two possibilities that she envisages for the raised element. Nor does she justify adjunction to Infl (as opposed to S or VP). In this paper we will argue in favor of the LF-raising of the whole superlative DP, which has been largely ignored in the following literature.

Szabolcsi's scopal/raising analysis (the two labels are interchangeably used in the literature) has been implemented by Heim (1999) in her three-argument analysis:

- (14) (Out of all of my friends), I offered **John** the most expensive book
 John_i [[C-EST]₂] [2 [1 [_{ip} I gave t_i **A t₂-expensive book**]]]]
 'There is a d such that I gave John a d-expensive book and for all other y in C (where C is a contextual set comprising Mary), I did not give y a d-expensive book'
 $[\text{-EST}] = \lambda C_{\langle e, t \rangle} . \lambda R_{\langle d, et \rangle} . \lambda x . \exists d [R(d)(x) \wedge \forall y [(y \in C \wedge y \neq x) \rightarrow \neg R(d)(y)]]$
 defined iff (i) $x \in C$ and (ii) $\forall y (y \in C \rightarrow \exists d R(d)(y))$

This LF differs from Szabolcsi's proposal in that (a) it is EST itself (rather than *the-est* or the overall DP) that raises at LF; (b) the definite article translates as an indefinite (see the A (for *a/an*) that precedes *d-expensive*); (c) EST takes a comparison class (C) as its first argument.

In the same paper Heim proposes a variant of the raising analysis in which EST raises above the correlate, adjoining to a <t>-type constituent, and C is a set of degree properties (an open degree

description) established via association with focus; this is a two-argument analysis (lacking the entity argument):

(15) (Out of all of my friends), I offered **John** the most expensive book

[C-EST_i] [1 [I gave [John]_f **A t₁-expensive book**] ~C]

‘There is a *d* such that I offered John a *d*-expensive book and for all degree properties *D*’ from a contextual set of the type ‘I offered *x* a *d*-expensive book’ such that *D*’ is distinct from ‘I offered John a *d*-expensive book’, *d* is not in *D*’

[-EST] = $\lambda C_{<d, dt>}. \lambda P_{<dt>}. \exists d[P(d) \wedge \forall Q[(Q \in C \wedge Q \neq P) \rightarrow \neg Q(d)]]$

defined iff (i) $P \in C$ and (ii) $\exists Q \in C: Q \neq P$

Both proposals are problematic insofar as they substitute one of the elements of the initial ‘numeration’ (i.e., the elements to which Merge applies in minimalist theories), namely the definite article with another one, the indefinite article. Importantly, the use of the definite article is not a quirk of English but it is crosslinguistically overwhelmingly used in languages with definite articles. Given this crosslinguistic generalization, the most promising line of inquiry is one that would treat relative superlative DPs not as indefinites, but rather as indeterminate definites, as proposed by Coppock, Beaver 2014 (see § 1.2 and § 2.4). The challenge is, of course, to explain why and how that happens.

2.2 Accounting for THE in the Raising Analysis: Krasikova (2012)

Within the raising analysis, an attempt of solving the problem of *the*, envisaged by Szabolcsi (1986), was to consider it a part of the superlative (*the...-est*), rather than as a D. This proposal is formally implemented by Krasikova (2012), who adopts a variant of Heim’s two-argument raising analysis (see (15)) for relative superlatives and proposes that THE is DegP-internal – see (16), corresponding to Krasikova’s (19):

(16) [_{NP} [_{AP} [_{DegP} the max C] highest] mountain]

According to this analysis, *max* roughly corresponds to EST in (15), characterizing the degree property *P* denoted by the clausal sister as the maximal element in the comparison set *C*, and *the* performs a uniqueness test on this property. The indefinite interpretation is explained as being due to the fact that *D*^o is empty.

Krasikova’s proposal makes wrong empirical predictions. For instance, in a language with postnominal superlatives we would expect to find *the* in *D* for the absolute reading and no *the* in *D*, but only a *the* before the adjective for the relative reading, but no language of

this type has been documented. On the contrary, postnominal superlatives with relative readings still occur with a definite article before the N, see e.g. Romance languages (Croitor, Giurgea 2016; Loccioni 2018):

- (17) Chi ha scalato [la montagna [più alta]] / *(una) montagna la più alta ? (It.)
who has climbed the mountain highest a mountain the highest
'Who climbed the highest mountain?'

Interestingly, we do find languages in which THE can be shown to be DegP-internal but nevertheless must co-occur with [_D,THE] (Croitor, Giurgea 2016; Loccioni 2018; Dobrovie-Sorin 2021). French (as well as Romanian, not exemplified here) is a case in point, see (18). Note that THE preceding the comparative functions as a dedicated superlative marker, which can have both relative and absolute readings:

- (18) Qui a lu [le livre [le plus long]]? (Fr.) ✓ relative, ✓ absolute
who has read the book the more long
'Who read the longest book?'

Current work in formal semantics follows Szabolcsi and Heim in assuming a uniform syntactic and semantic analysis for quantity and quality superlatives. But interestingly, in certain languages these two types show morpho-syntactic differences that suggest that Krasikova's proposal may be adequate for quantity superlatives, but crucially not for quality superlatives. This point was made for French superlatives by Dobrovie-Sorin (2021):

- (19) Qui a lu [_{DP}[_D,∅] [_{MeasP}[_{Spec},Meas] le plus] [_{Meas}[_{Meas},∅] [_{NP}de livres]]] ?

The French *le plus* lit. 'the more', meaning 'the most', occurs in a pseudo-partitive configuration (on a par with *beaucoup* 'many, much'), in which [_D,THE] is normally absent. Hence it is natural to assume that the *le* preceding *plus* is part of the DegP.²

In the present paper we are only concerned with the relative readings of *quality* superlatives. We do not assume that the generalizations and the proposed analysis extend to quantity superlatives.

Another interesting pattern can be observed in Swedish, where 'quasi-definite' superlatives are built with a strong form of THE preceding the Adj, while the head N lacks the definite suffix. Such DPs have been argued by Coppock and Engdahl (2016) to be genuinely indefinite DPs (the strong THE is not in D° but inside the AdjP) with an

² Wilson (2018) argues that even in English, *the* in the quantity superlative *the most* (N) does not sit in D, as opposed to *the* with quality superlatives.

relative interpretation, see (20)a. But unlike what we would expect given Krasikova's proposal, the lack of the definite suffix is not allowed by relative superlatives preceded by a strong definite, see (20)b:

- (20) a. Vi följer utvecklingen med **det** största intresse.
we follow development-the with the greatest interest
'We are following the development with *the greatest interest*.'
(Coppock, Engdahl 2016, ex. 2)
- b. Fredrik köpte **de** dyraste vinet (Coppock, Josefson 2015, ex. 29)
Fredrik bought the expensive-est wine-the
'Fredrik bought the most expensive wine' (relative reading possible)

Coppock and Josefson (2015) point out that both articles can be optionally dropped in relative superlatives, but not in absolute superlatives. This optionality in the definite marking of relative superlatives has also been observed in Bulgarian (Pancheva, Tomaszewicz 2012; Mostrov 2021) and Norwegian (Simonenko 2012), but it remains cross-linguistically rare.

Note that this type of superlative, in which THE is missing, is orthogonal to Krasikova's proposal, according to which a phonologically realized THE is DegP-internal in relative superlatives. The observations made above showed that DegP-internal THE's are found in certain superlative DPs that lack [_D,THE] (quantitatives in French or relatives in Swedish) but such configurations are crucially not found for relative quality superlatives. Our conclusion regarding crosslinguistic variation can be stated as follows:

- (21) a. [_D,THE] is obligatory with adnominal *quality* Sup's regardless of relative vs absolute readings in most of the languages for which there is documentation on this distinction (English, German, Romance, Greek, Hungarian, Albanian, Arabic).
- b. In a rather small number of languages [_D,THE] is optional with relative superlatives but obligatory with absolute superlatives.

2.3 Splitting Definiteness

A different perspective on relative superlatives was adopted by Coppock and Beaver (2014) and Bumford (2017), who attribute their apparently paradoxical nature to general properties of definite articles.

According to Coppock and Beaver (2014) the defining property of definite articles is the uniqueness presupposition, which may but need not combine with determinate reference, yielding either determinate definites or indeterminate definites. Relative superlatives, as well as definites built with *only*, belong to the second type. As demonstrated by Coppock and Beaver themselves, their analysis of indeterminate definiteness is incompatible with a raising analysis, which

forced them to adopt an *in-situ* analysis. The problem of *in-situ* analyses is that they cannot capture the fact that the frame of comparison is obtained on the basis of the syntax³ (as insisted upon by Szabolcsi (1986) and as seems obvious by just examining examples, in particular pairs such as (12)a-b). For instance, in Coppock and Beaver's (2014) analysis, the relation that associates book-receivers and books in (12)b and (14) is an argument of EST but does not correspond to an (overt) syntactic constituent, it is a free variable that receives a value in the context. It is not clear what principles forces this value to match the predicate of the clause. Further arguments in favor of the LF-raising analysis are given in § 2.4 below.

According to Bumford (2017), who proposes a dynamic-semantics analysis, definite articles allow for 'delayed uniqueness', which means that uniqueness is interpreted DP-externally, as a filter on variable assignments, which applies immediately above EST (which is likewise a filter); EST itself is DP-external (as in Szabolcsi's and Heim's analyses), and the DP is interpreted as an indefinite. In this analysis, it is not clear why the superlative *requires* the existence of this filter. It looks as though the uniqueness component of D and EST are connected somehow and forced to raise together (the former immediately above the latter).⁴ Bumford (2017) proposes that THE and EST form a constituent, which is problematic given the data we have seen in § 2.2. However, the idea of a determiner+superlative complex comes close to our proposal, in which the superlative acts as the determiner of the DP. In Bumford and Sharvit (2022), the idea that the superlative and the determiner may raise together as a complex quantifier is mentioned as a possibility (but not formally implemented).

3 The *in-situ* proposal that comes closest to this desideratum seems to be the one suggested (and eventually discarded) in Heim (1999) and adopted by Pancheva and Tomaszewicz (2012): the comparison class argument (C) of EST would be restricted to the alternatives provided by focus, represented as a variable in the structure in the manner of Rooth (1992).

4 Bumford (2017) provides independent evidence for delayed uniqueness checking, coming from the so-called 'Haddock sentences', see (i), acceptable in a context where there are several hats but only one of them contains a rabbit:

(i) the rabbit in the hat.

However, in this case the uniqueness filter is not obligatory; (ii) is also acceptable in the very same context:

(ii) the rabbit in a hat/one of the hats.

With relative superlatives, the definite article is obligatory.

2.4 What We Want to Preserve: LF Raising and Indeterminate Definiteness

The brief overview sketched above shows that none of the existing proposals is successful in providing a satisfying analysis of relative superlatives. Nevertheless, some clear desiderata for an adequate analysis emerge from this previous literature.

The first one is the necessity of LF-raising. In addition to the advantage of deriving the domain of comparison in a compositional way (see § 2.1), this analysis is supported by syntactic arguments. First, as pointed out by Szabolcsi, the correlate must be a co-argument of the superlative DP:

- (22) a. Who_i did you claim [_t got **the fewest letters**]?
b. *Who said [that you got **the fewest letters**]? (Szabolcsi 1986, ex. 26a, c)

A further observation going in the same direction was made by Chacón and Wellwood (2012) and taken up by Bumford (2017). As illustrated below, relative readings are impossible with DP-initial possessors in English:

- (23) a. Ty chose the tastiest cookies of Sue's (of all the cookies/of all the party guests).
b. Ty chose Sue's tastiest cookies (of all the cookies/# of all the party guests).
c. Ty ate the most cookies of Sue's.
d. *Ty ate Sue's most cookies. (Chacon, Wellwood 2012, (11)-(14))
- (24) a. the student who read Shakespeare's longest play (*relative)
b. the student who read the longest Shakespeare play (✓ relative)
c. the student who read the longest play of Shakespeare's (✓ relative)
(Bumford 2017, 14)

Bumford (2017) uses this generalization as evidence in favor of his view that the 'delayed uniqueness' that characterizes relative superlatives is a property of THE itself: since THE is absent with DP-initial possessors, delayed uniqueness is impossible. An alternative explanation will be proposed after we have presented our own analysis. For the time being, the reason for invoking these examples is simply that they plead against *in-situ* analyses.

A further interesting generalization concerns Italian pronominal superlatives, which do not have relative readings, in contrast to post-nominal superlatives (Cinque 2010; Loccioni 2018; for an example of relative postnominal superlative, see (17) above):

- (25) Chi ha scalato la più alta montagna innevata? ✓ absolute, * relative
who has climbed the more high mountain snowy (Cinque 2010, 12, ex. 23)
"Who climbed the highest snowy mountain?" (= Who climbed Mt. Everest?)

Such syntactic constraints strongly suggest that the difference between absolute and relative superlatives needs to be represented at LF.

In view of these arguments, we will adopt an LF-raising analysis of relative superlatives. But we will revise Heim's implementation in order to get rid of the assumption that THE translates as A at LF. Superlative DPs will end up being analyzed as definite DPs (i.e., DPs that satisfy uniqueness) that are 'indeterminate' (assert rather than presuppose existence). This characterization is similar to Coppock and Beaver's (2014) definition of indeterminate definites. But our proposal will be crucially different, allowing us to reconcile indeterminate definiteness with raising. As acknowledged by Coppock and Beaver themselves, such a reconciliation is unfeasible within their own theory of indeterminate definiteness.

3 Proposal

Our proposal will rely on two LF raising operations: (i) inside its host DP, EST raises to Spec,DP; (ii) the whole of the DP_{sup} raises out of the IP (which had been envisaged by Szabolcsi 1986, but never pursued since) in order to take parasitic scope on the scope of the correlate, which in our analysis is an argument of EST. The semantics that is read off this syntactic representation treats the relative EST as a quantificational determiner, while THE itself is semantically vacuous.

Importantly, this analysis is meant for adnominal quality relative superlatives only. We leave aside quantity superlatives (both adnominal and DP-external), adverbial superlatives as well as quality superlatives in predicate positions. Given that in adverbial and predicate positions it is not embedded inside a DP, the relative EST can directly raise to a parasitic scope position (much like in Heim's analyses). Quantity superlatives, on the other hand, sit in Spec,MeasP (on a par with their positive counterparts, MANY/MUCH and LITTLE/FEW), a position from which they can raise (just like their positive counterparts).⁵

⁵ Certain phrases in SpecMeasP can raise in overt syntax in French (*beaucoup* 'many/much', *combien* 'how many/much'):

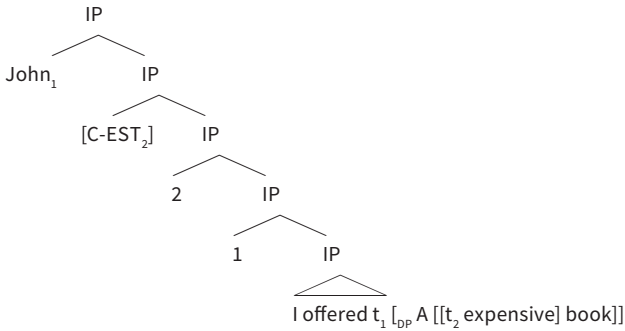
(i) J'ai beaucoup, lu [t_i de livres](Fr.)
I have many read of books
'I read many books.'

3.1 Parasitic Scope

On Heim's (1999) 3-argument analysis (see (14) repeated in (27) below) EST takes parasitic scope wrt the *correlate*: EST+C tucks in between the raised correlate and its scope:

(26) I offered **John** the most expensive book.

(27) $[_{ip}[_{John}_1] [_{ip}[C-EST_2] [2 [_{ip}I offered t_1 A t_2\text{-expensive book}]]]]]$



The notion of ‘parasitic scope’ was coined by Barker (2007) in his analysis of the so-called ‘sentence-internal reading’ of *(the) same*. The LF shown in (28)’ is a bracketed and simplified version of Barker’s representation (41), in which we have replaced Barker’s labels for the adjunction nodes with IP (in order to bring out the comparison with Heim’s analysis of the parasitic scope of C-EST):

(28) The same waiter served everyone.

(28)’ $[everyone_1 [_{ip} same_2 [_{ip} 2[_{ip} 1[_{ip} [the t_2 waiter][served t_1]]]]]]]$

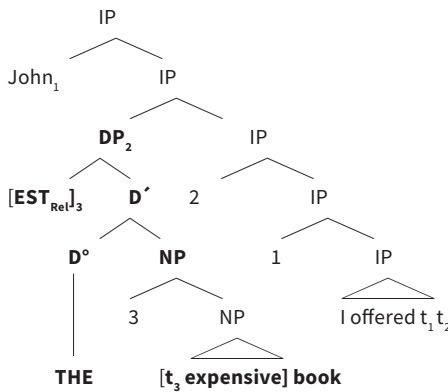
In this configuration, ‘the scope target for *same* does not even exist until *everyone* has taken scope. The adjective then hijacks the scope of *everyone*, intervening between the quantifier and what would otherwise be its semantic argument’ (Barker p. 21). Barker does not extend the parasitic-scope analysis to other phenomena, in particular he does not observe that relative superlatives also involve parasitic scope. We believe that outlining the relevance of parasitic scope is an important independent argument in favor of the LF raising analysis: the analysis is not specifically designed for the relative EST itself, but instead pertains to a larger group of phenomena, largely understudied.

3.2 Est Raises DP-internally and DP_{sup} Raises to a Parasitic-scope Position

As we have repeatedly observed in previous sections, the problematic part of the raising analysis is the replacement of THE with A (and the correlated indefinite analysis of the definite-marked DP_{sup}). The solution that we will propose below can be summarized as follows:

- (29) a. EST raises, but only DP-internally (see the bolded part of the tree in (30))
- b. DP_{sup} raises to a parasitic-scope position

[_{IP}[John₁] [_{IP}[_{DP₂}the most expensive book] [2 [1 [_{IP}I offered t₁ t₂]]]]]



This revision of Heim’s analysis is similar to Solomon’s (2009) revision of Barker (2007). It is not *same* itself but the whole DP *the same N* that takes parasitic scope, as in (28)”, which is our own rewriting of Solomon’s analysis:

(28)” [_{IP}everyone₁ [_{IP}the-same-waiter₂ [_{IP}2[_{IP}1[_{IP}t₂ [_{VP}served t₁]]]]]]]

3.3 EST as a Quantificational Determiner: The Semantic Composition

The LF analysis proposed above offers a non-stipulative syntactic basis for the compositional semantics. Thus, we do not need to assume a syntactically non-realized comparison-class argument, the role of which is played by a relation ($\lambda x \lambda y$ I offered x to y) that is obtained by abstracting over the traces of the two raised arguments (*John* and DP_{RelSup}). This relation (notated R below) functions as the first argument of the raised DP_{Sup}, the second argument of which is

an entity, the correlate (notated y), on which DP_{RelSup} takes parasitic scope. Hence, the denotation of DP_{RelSup} is (31):

$$(31) \llbracket \text{the most expensive book} \rrbracket = \lambda R_{\langle e, \text{et} \rangle} . \lambda y . \exists x \exists d [\text{book}(x) \wedge R(y, x) \wedge \text{expensive}(d)(x) \wedge \forall x', y', d' [\llbracket \text{book}(x') \wedge \text{expensive}(d')(x') \wedge x' \neq x \wedge R(y', x') \rrbracket \rightarrow d > d']]$$

From this denotation we can extract the denotation of EST itself. But note that (31) is the denotation of a relative superlative DP, which means that the EST on which it is built corresponds only to the relative reading, hence the notation EST_{Rel} adopted below:

$$(32) \llbracket EST_{\text{Rel}} \rrbracket = \lambda P_{\langle d, \text{et} \rangle} . \lambda R_{\langle e, \text{et} \rangle} . \lambda y . \exists x \exists d [R(y, x) \wedge P(d)(x) \wedge \forall x', y', d' [\llbracket P(d')(x') \wedge x' \neq x \wedge R(y', x') \rrbracket \rightarrow d > d']]$$

This is a quantificational-determiner denotation, which matches with the Spec,DP position that we proposed EST_{Rel} occupies at LF (see the internal structure of DP_2 in tree (30)).

By applying (32) to its first argument P ($\llbracket t_{\text{Deg}} \text{ expensive book} \rrbracket$) we get the denotation of $\llbracket DP_{\text{Sup}} \text{ the most expensive book} \rrbracket$ given in (31) (see $\llbracket DP_2 \rrbracket$ in tree (30)). The R and y arguments of (31) are then filled with $\lambda x . \lambda y . I \text{ offered } x \text{ to } y$ and with *John*, yielding the meaning ‘there is a book offered by me to John that is expensive to a degree d that is not attained by any book x' that was offered by me to someone in the relevant situation’. By saturating the formula in (31) with the R -argument ($\lambda x \lambda y I \text{ offered } x \text{ to } y$) and with the y -argument (*John*) we get:

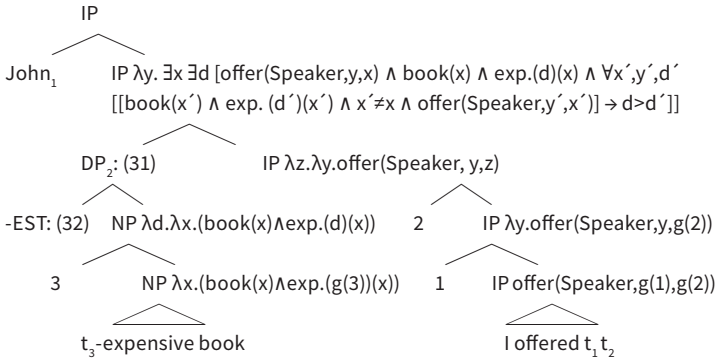
$$(33) \exists x \exists d [I \text{ offered } x \text{ to } y \wedge \text{book}(x) \wedge \text{expensive}(d)(x) \wedge \forall x', y', d' [\llbracket \text{book}(x') \wedge \text{expensive}(d')(x') \wedge x' \neq x \wedge I \text{ offered } x' \text{ to } y' \rrbracket \rightarrow d > d']]$$

Below is the representation of the semantic composition in a tree-form (abstracting away from time and world/situation variables, for readability). For readability we have not inserted in the tree the denotations of DP_2 and EST, which we have signaled as (31) and (32), to be found above.⁶ It should be observed that the denotation of EST_{rel} proposed here is in line with Szabolcsi’s (1986) assumption that the relative and absolute EST’s are distinct⁷ (endorsed also by Krasikova 2012).

⁶ We have also not included D^0 in the tree, which is uninterpreted (see § 3.4). If all terminals need to be given a denotation in the tree, this uninterpretability can be represented by using an identity function: the denotation would be $\lambda R_{\langle d, \text{et} \rangle} . R$.

⁷ For absolute superlatives, we assume a modifier denotation; we will not decide here among the possible analyses (e.g., with separate AP and NP arguments or with EST taking scope over AP+NP, but below D). Most analyses propose a uniform denotation for relative and absolute EST. Heim’s 3 argument analysis in (14)(i) explicitly covers both readings. For the 2-argument analysis in (14)(ii), Heim did not address absolute readings; Romero 2013 extended the 2 argument analysis to DP-internal -EST by assuming

- (34) $\exists x \exists d [\text{offer}(\text{Speaker}, \text{John}, x) \wedge \text{book}(x) \wedge \text{exp.}(d)(x) \wedge \forall x', y', d' [[\text{book}(x') \wedge \text{exp.}(d')(x') \wedge x' \neq x \wedge \text{offer}(\text{Speaker}, y', x')] \rightarrow d > d']]$



3.4 Vacuousness of THE and the issue of definiteness

In (30) [_{D°}THE] itself is semantically vacuous.⁸ But why does D° surface as a definite article? We propose that D⁰ carries a definiteness feature as a result of Spec-Head agreement between EST_{Rel} and D. The [def] feature on EST_{Rel} is justified by the fact that its denotation (see (32)) entails Russellian definiteness: the property ‘be a book offered by me to John that is expensive to a degree d that is not attained by any book x’ that was offered by me to someone in the relevant situation’ is satisfied by at most one book (note that (31) compares the relevant book with books given to other people as well as with other books given by the speaker to John).

EST_{Rel} however differs from run-of-the-mil definites by *asserting* rather than presupposing existence, which explains the indefinite-like behavior of relative superlatives.

Let us stress that under this proposal the indeterminacy of relative superlatives is not a property of THE, but is triggered by the raising of EST_{Rel} to Spec,DP.

a reduced relative structure, with -EST attaching below the relative operator PRO, to a t-type constituent, and focus on the trace of the relative operator.

⁸ On the proposal that an operator in SpecDP is associated to a non-interpreted D, see Giusti (2002, 2015).

3.5 Explaining the Syntactic Constraints on Relative Superlatives

The relevance of the SpecDP position is visible in the syntactic constraints on relative superlatives. We have seen in § 2.4 that prenominal superlatives disallow the relative reading in Italian, see (25). However, in Romanian, a closely related language, this reading is allowed, see (35). This can be correlated to the fact that prenominal superlatives sit in SpecDP in Romanian (as shown by Giurgea 2013 with various tests, see e.g. the combination with cardinals in (36):

(35) Cine a urcat [[cel mai înalt][_p∅] munte]]?
who has climbed SUP more high mountain
'Who climbed the highest mountain?'

(36) a. [cele mai bogate] două țări (Ro.)
SUP more rich two countries
b. i due [più ricchi] paesi (It.)
the two more rich countries
'the two richest countries'

For Italian, the ban on relative readings in prenominal positions can be explained by assuming that this is a DP-internal scope position (lower than Spec,DP).

Syrian Arabic resembles Italian insofar as superlatives surface as comparatives embedded in definite DPs. However, prenominal superlatives resort to a construct state construction, in which there is no overt D. This construction allows relative readings (see Hallman 2021), which can be explained if construct states instantiate (at least sometimes) a SpecDP + null D configuration. Interestingly, Syrian Arabic also allows an 'analytic' superlative in which only the EST head, identical to the word *most*, occurs in DP-initial position, see (37)b. This supports our structures in (30) in which only EST is interpreted in SpecDP (rather than the entire Deg+AP constituent).

(37) a. mi:n ʔalaʕ ʕala aʕla ʒabal?
who climbed on highest mountain
b. mi:n ʔalaʕ ʕala aktar ʒabal ʕa:li?
who climbed on most mountain high
'Who climbed the highest mountain?'

Our proposal offers a straightforward account for the fact that DP-initial possessors block relative readings in English, see (23)-(24): DP-initial possessors sit in Spec,DP, which blocks EST-to-SpecDP.

3.6 No Need of Covert Comparison Classes

An important difference between our analysis in (32) and Heim's influential analyses in (14)-(15) is that we do not make use of covert comparison classes as arguments of relative superlatives. This is a welcome feature, because superlatives do not have any syntactic argument that corresponds to the postulated comparison-class semantic argument (except in very specific constructions, such as *possible* in modal superlatives, see Romero 2013, and degree relative clauses in examples such as *Mary sang the loudest [that any soprano ever sang]*, see Howard 2014)⁹. Krasikova (2012), a supporter of Heim's analysis for relative readings, abandoned the comparison-class argument for absolute superlatives and proposed instead that the first argument of EST/SUP is the set denoted by the NP. Under this view the domain restriction of the NP-set is an instantiation of a general phenomenon, which appears with all quantifiers (be they determiners or adverbials), and which is currently explained as being due to the presence of a situation argument that all predicates have (see Schwarz 2009, Heim 2011 and references therein).

In our analysis, which dispenses with comparison classes for relative readings as well, the domain-restriction can also be captured by resorting to the situation argument: the condition "book(x') \wedge expensive(d')(x') \wedge x' \neq x \wedge I offered x' to y'" is relativized to a situation (not represented in (32) for simplicity), by virtue of the situation argument present on all predicates. Therefore, only individuals in the contextually relevant situation are compared. An entry that includes situations would look as follows:

$$(33) \text{ [EST}_{\text{Rel}}] = \lambda P_{\langle d, \text{et} \rangle} \cdot \lambda R_{\langle e, \text{et} \rangle} \cdot \lambda y. \lambda s. \exists x \exists d [R(x)(y)(s) \wedge P(d)(x)(s) \wedge \forall x', y', d' [[P(d')(x')(s) \wedge x' \neq x \wedge R(x')(y')(s)] \rightarrow d > d']]$$

⁹ Our view is that EST takes a comparison-class argument only when this argument is overt, e.g., *possible*+CP or degree-CP: for such examples, a special entry of EST is to be assumed. Note that degree-relative arguments are language-specific (Romanian, for instance, lacks this type altogether), unlike relative readings of superlatives, which means that at least for languages such as Romanian we cannot use the existence of degree-CP arguments of EST to support the hypothesis of a covert comparison-class argument for superlatives at large.

Phrases of the type *out of...*, see *Out of all my students, she wrote the best essay*, seem to be licensed by focus, specifying the domain of variation of the focalized part, rather than by EST - see the following examples (found on Google) of this type of phrases in sentences without superlatives:

- (i) Out of all the rumored contenders, I think this trio can do wonders on screen.
- (ii) Out of all the Europeans only the British succeeded in establishing an empire in India.
- (iii) Out of all the candidates, why should we hire you?

In Heim's two-argument analysis (see (15)), the comparison class argument, besides providing contextual restrictions, plays a crucial role: it provides the characterizing property of the set of elements that are compared (which are degree properties; only by specifying C, via focus association, we know with which degree properties we compare the abstract over degrees created by raising of EST). In our analysis, the two roles played by Heim's comparison-class argument are separated: the relation R (the second argument of EST) accomplishes the characterizing-property role of Heim's comparative class, and the contextual-restriction role is played by situation-variables.

As observed by a reviewer, our analysis is more in line with minimalist approaches insofar as the syntactic derivation is not allowed to modify the initial numeration that serves as its input. Since arguably the numeration of sentences built with relative superlatives does not contain any element corresponding to the comparison class, a syntax-faithful semantic analysis should not make use of a comparison-class argument for the analysis of superlatives.

4 Note on the Upstairs De Dicto Reading

Another difference between our analysis and Heim's is that Heim's analyses allow EST and DP_{Sup} to have different scope positions. Heim (1999) argues that split scope is indeed attested for relative superlatives in examples such as (38), where John's and the others' wishes are not about specific mountains (therefore DP_{Sup} scopes below *want*) but about specific mountain heights (therefore EST scopes above *want*; this reading was called 'upstairs de dicto' by Sharvit, Stateva 2002):

- (38) [Context: John wants to climb a mountain that should be 6000 m. high, Mary wants to climb a mountain that should be 4000 m. high, Bill wants to climb a mountain that should be 1000 m. high]

John wants to climb the highest mountain.

John λx **EST** λd [want λw [$\exists y$. [y is a d-high mountain in w and x climbs y in w]]]

Our analysis, in which EST acts as the determiner of DP_{Sup} , does not allow the representation in (38). However, there is a possible analysis that does not involve split scope. We start from the observation that such readings are possible only in contexts that provide the information that the people under discussion have wishes about mountain heights (Heim herself says that this reading "may not be the most salient reading, but it is quite available in an appropriate context", and provides a scenario involving answers to the question *How high a mountain do you want to climb?*). We propose that in such a context a classification of mountains depending on height becomes

salient, and (38) compares these mountain types, rather than individual mountains. In other words, (38) is equivalent to *John wants to climb the highest mountain type*. The sentence is about specific mountain types, so DP_{Sup} scopes above *want*:

(39) John λx [EST λd [d-high mountain-type]] λy . x wants to climb y

The interpretation of *climb y* in (39) involves a type-shifting from types (kinds) to tokens, via the realization relation, as in (40):

(40) I climbed this kind of mountain before.

The fact that types are involved is supported by the possibility of using type-denoting DPs without superlatives in similar contexts, see the scenario in (41):

(41) [Context: what type of car do they want? John wants a Toyota, Ruth wants a Mercedes, Alex wants a Ford]
John wants the Asian car

Note that in this example, exactly as in (38), the characterization of the type wanted by John does not report his thoughts (he may not know that Toyotas are produced in Asia) – likewise, in (38) the comparison performed by EST is not part of John’s wish.

Evidence that ‘upstairs de dicto’ readings involve de re comparison of types of objects rather than of degrees comes from examples with cardinals, such as (42). Like (38), this is not about particular essays, but only about types of essays characterized exclusively by length. But here Heim’s analysis in (38) is inapplicable. The cardinal cannot be below *want* because the sentence does not compare sets of two essays (Peter, e.g., needs to write a single essay). Like for plural superlatives in general, the sentence is true if the objects in the plurality characterized as ‘highest’ are high (at least) to a degree not attained by any object that is not in that plurality.

(42) [Context: John needs to write a 15 page essay for the literature class and a 10 page essay for the history class, Mary needs to write an 8 page essay for her literature class and a 6 page essay for her politics class, Peter needs to write a 7 page essay for his art class]
John needs to write the two longest essays

But if the cardinal is interpreted above *want*, in Heim’s analysis it should apply to the degree, because only degrees scope above *want* in her analysis. But cardinals are not used to count degrees. Therefore, Heim’s analyses cannot apply to (42).

5 Conclusions

The present paper aimed at proposing a solution for the contradiction between the definite marking of relative superlatives and their apparent indefiniteness. Our solution can be summarized as follows: (i) the indefinite article does not appear because D is not interpreted at all; (ii) The [def] feature is a defining property of [EST]_{rel} and is simply repeated (via agreement) on D.

The compositional analysis that we propose is close to the syntax: (i) comparison classes are dispensed with, which is desirable, because the syntax does not give us any comparison class for relative superlatives; (ii) we use as arguments what the syntax gives us: a correlate and a relation between the correlate and the measured entity (external argument of the superlative). These two elements are what syntax provides, under the assumption that the relative DP tucks in below the correlate (“parasitic scope”).

We have stressed the role of parasitic scope, which brings together elements (*same* and EST) that are similar in that their denotations depend on the scope of another element but nevertheless differ in their lexical properties, which specify the relevant type of relation: the identity relation (for *same*) or having the highest degree of a certain property (for superlatives).

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