# Modal Superlatives and Ellipsis

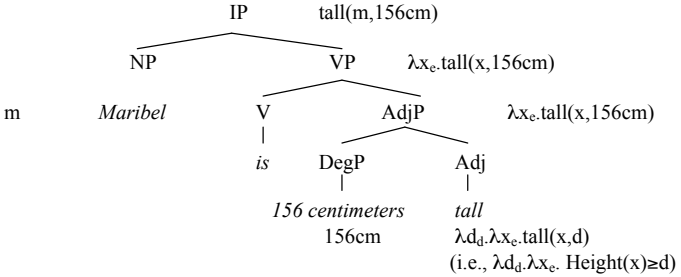
Maribel Romero
maribel.romero@uni-konstanz.de
University of Konstanz

*Ellipsis 2012 crosslinguistic, formal, semantics, discoursive and processing perspectives.*
University of Vigo, November 9-10, 2012

## 1. Introduction

■ It is assumed that gradable adjectives denote relations between individuals and degrees: (1). Gradable adjectives are downward monotonic; that is, if Maribel is 156cm tall, then *tall(m,156cm)* is true, *tall(m,155cm)* is true, *tall(m,154cm)* is true, etc.

(1) Maribel is 156 centimeters tall.




■ The comparative morpheme *-er* and the superlative morpheme *-est* operate on the degree argument of gradable predicates:

(2) John is tall**er** than Bill ⇔ John is tall to a degree to which Bill is not
⇔ ∃d [tall(j,d) ∧ ¬tall(b,d)] (Seuren 1973)

(3) [[*-er*]] = $\lambda Q_{<d,t>}.\lambda P_{<d,t>}.\ \exists d\ [P(d)\ \&\ \neg(Q(d))]$ (Heim 2006)

(4) John is the tall**est** (in group C)
⇔ John is tall to a degree to which nobody else in group C is tall
⇔ ∃d [ tall(j,d) & ∀z∈C [z≠j → ¬tall(z,d)] ] (Heim 1999)

(5) [[*-est*]] = $\lambda \mathbf{Q}_{<dt,t>}.\lambda P_{<d,t>}.\ \exists d\ [\ P(d)\ \&\ \forall Q \in \mathbf{Q}\ [Q \neq P \rightarrow \neg(Q(d))]\ ]$ (Heim 1999)

■ Superlatives with modal modifiers like *possible* (Corver 1997, Larson 2000, Schwarz 2005): Prenominal *possible* with superlatives gives rise to two readings: (7), (9).

(6) John is a possible liar.

(7) John is the smartest possible liar.
a. Regular modifier reading: "John is possibly a liar and he is smarter than any other (relevant) individual that is possibly a liar."
b. Modal superlative reading: "John is as smart a liar as possible for him/one to be."





(8) John talked to some possible guests.

(9) John talked to the fewest possible guests.
a. "John talked to fewer individuals that possibly were guests than anybody else (relevant) did."
b. "John talked to as few guests as it was possible for him/one to talk to."

(a) Regular Noun modifier *possible*
⇨ (b) Modal superlative reading: "as X as possible"

■ Some interesting syntactic restrictions have been observed: ①, ②, ③.

- Restriction ①: While *possible* and certain adjectives ending in *-able* (e.g. *imaginable*, *conceivable*, etc.) allow for the modal superlative reading, other semantically similar adjectives do not, like *potential* and *probable* (Larson 2000).

(10) John is the smartest possible / imaginable / conceivable liar.

(11) John is the smartest potential / probable liar.

- Restriction ②: When the modal adjective appears postnominally, the modal superlative reading is the only one available (Larson 2000).

(12) John is the smartest liar possible.
a. * Regular modifier reading.
b. ✓ Modal superlative reading.

(13) John talked to the fewest guests possible.
a. * Regular modifier reading.
b. ✓ Modal superlative reading.

- Restriction ③: The prenominal modal adjective requires syntactic locality with the superlative morpheme *-est* in order for the modal superlative reading to arise (Schwarz 2005):

(14) Ich habe das größt.**e** möglich.**e** Geschenk gekauft.
I have the largest.**Infl** possible.**Infl** present gekauft
'Out of the possible presents, I bought the largest one.' Regular modifier

(15) Ich habe das größt möglich.**e** Geschenk gekauft.
I have the largest possible.**Infl** present gekauft
'I bought as large a present as it was possible for me/one to buy.' Modal Superlative

(16) I bought the largest **affordable** possible present.
a. "Out of objects that were affordable possible presents, I bought the largest one."
b. * "I bought as large an affordable present as it was possible for me/one to buy."

■ Previous analyses of the modal superlative reading:

- Larson (2000) on ① and ②: *possible* + $\blacktriangle_{ACD,nonfinite}$ generated postnominally; promotion to prenominal position.

(17) a. I bought the largest present [$_{Reduced\ RC}$ possible for me to buy]
b. I bought the largest present [possible $\blacktriangle_{ACD}$]
c. I bought the largest possible present [ t $\blacktriangle_{ACD}$]

(18) a. It is possible [PRO / for John to interview that candidate].
b. * It is potential / probable [PRO / for John to interview that candidate].

- Schwarz (2005) on ③: non-decomposable degree operator *[-est possible]*, since:
  - comparison of worlds rather than among several degree properties
  - different quantificational force: "at least as high" rather than "highest"

(19) $[\![\textit{-est possible}]\!]^w = \lambda P_{<s,dt>}.\ \forall d\ [\ \exists w'[wRw' \ \&\ P(w')(d)=1] \rightarrow P(w)(d)=1\ ]$

■ **GOAL** of this talk: To present an analysis of the modal superlative reading (building on Romero 2010) that:

**(i)** compositionally derives the appropriate truth conditions while maintaining standard separate lexical entries for *-est* and *possible* (contra Schwarz 2005);

**(ii)** allows us to reconcile the empirical restrictions ①+② with ③:
- *[-est possible]* (plus some elliptical material) will be treated as a syntactic unit (with Schwarz 2005, contra Larson 2000).
- The modal superlative reading arises from an LF structure with an ACD clause (with Larson 2000, contra Schwarz 2005).

**(iii)** derives further correct predictions concerning the shape and size of the recovered ellipsis site.

■ Plot of the rest of this talk:

§2. Background: LF analyses of degree constructions.
§3. Proposal: A compositional analysis of the modal superlative reading.
§4. Reconciling the three empirical restrictions.
§5. Testing further predictions of the proposal.
§6. Conclusions.

## 2. BACKGROUND: LF ANALYSES OF DEGREE CONSTRUCTIONS

### 2.1. Superlatives and the absolute / relative ambiguity.

■ Ambiguity found in superlatives with covert argument C (Szabolcsi 1986, Heim 1999):

(20) John climbed the highest mountain.
a. ABSOLUTE reading: "John climbed a/the mountain higher than any other mountain."
b. RELATIVE reading: "John climbled a higher mountain than anybody else climbed."



(21) Who wrote the largest prime number on the blackboard?
a. Nobody, of course! There is no largest prime number! ABSOLUTE reading
b. John did. He was the only one above 100. RELATIVE reading

■ The exact content of the RELATIVE reading depends on the focal structure of the sentence:

(22) a. John wrote the longest letter to MARY.
b. JOHN wrote the longest letter to Mary.

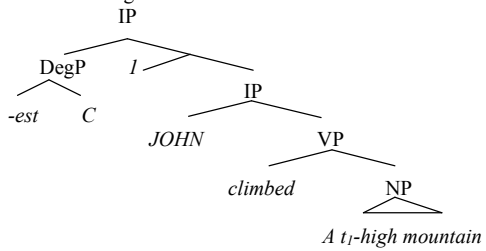
■ Heim's (1999) analysis:
Assumptions:
*-est* can undergo LF movement out of its host DP.
The definite article *the* is semantically vacuous. Instead, THE or A.
Thesis:
The LF position of *–est* determines whether we get the absolute or the relative reading.
The focus structure of the complement of *-est* shapes the reading further via ~ C.

(23) $[\![\textit{-est}]\!] = \lambda\mathbf{Q}_{<dt,t>}.\lambda P_{<d,t>}.\ \exists d\ [\ P(d)\ \ \&\ \ \forall Q \in \mathbf{Q}\ [Q \neq P \rightarrow \neg Q(d)]\ ]$

(24) $[\![\alpha \sim C]\!]$ is felicitous only if C is a subset of the focus semantic value of $\alpha$.
(Rooth 1992)

■ RELATIVE reading:

(25) JOHN climbed the highest mountain.




(26) a. LF: [ [-est C] [1[JOHN$_F$ climbed A $t_1$-high mountain]] ~ C ]
b. C $\subseteq$ $[\![\textit{1[JOHN}_F\textit{ climbed A } t_1\textit{-high mountain]}]\!]^f$
C $\subseteq$ { λd'. x climbed a d'-high mountain: x∈$D_e$ }
C $\subseteq$ { λd'. John climbed a d'-high mountain,
λd'. Bill climbed a d'-high mountain,
λd'. Chris climbed a d'-high mountain, ... }
c. ∃d [ ∃z[mount(z) & high(z,d) & climb(j,z)] &
∀Q∈C [ Q ≠ (λd'. John climbed a d'-high mountain) → ¬(Q(d)) ] ]

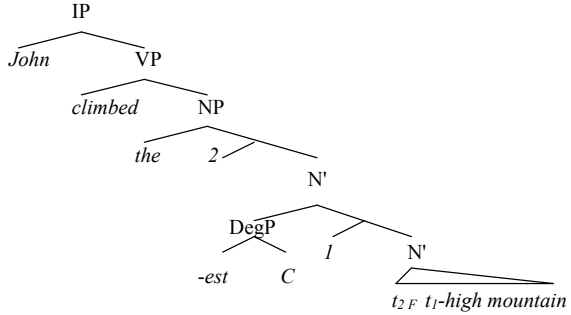
■ ABSOLUTE reading: [MR's version]

(27) Extra assumption: Traces and other empty categories can be focus-marked.[1]

(28) a. I met the person that John wrote the longest letter to $t_F$. Cf. (22a)
b. I met the person that $t_F$ wrote the longest letter to Mary. Cf. (22b)

(29) How does one impress Mary?
By $PRO_F$ writing the longest letter to her. Cf. (22b)

(30) John climbed the highest mountain.




(31) a. LF: John climbed THE 2 [ [-est C] [1[ $t_{2,F}$ $t_1$-high mountain]]~C ]
b. C ⊆ $[\![1[t_{2\,F}\ t_1\text{-high mountain}]]\!]^f$
C ⊆ { λd'. x is a d'-high mountain: x∈$D_e$ }
C ⊆ { λd'. Everest is a d'-high mountain,
λd'. Kilimanjaro is a d'-high mountain,
λd'. Aneto is a d'-high mountain, ... }
c. John climbed the unique z: ∃d [ mount(z) & hight(z,d) &
∀Q∈C [Q ≠ (λd'.z is a d'-high mountain) → ¬Q(d)] ]

**2.2. Comparatives: the *than*-complement and type conversion**

■ The comparative morpheme *-er* combines with the *than*-clause or phrase to form a Degree Phrase (DegP). Just like with *–est*, the DegP headed by *-er* can undergo LF movement to gain sentential scope (von Stechow 1984, Rullmann 1995, Heim 2000).

(32) $\lambda Q_{<d,t>}.\lambda P_{<d,t>}.\ \exists d\ [P(d) \& \neg(Q(d))]$ (Heim 2006)

[1] Instead of making *-est* associate with focus and allowing F-marking on phonologically null elements, we could let *-est* associate with a contextually salient set of situations, as Beaver and Clark (2003) explicitly argue for *always*



(33) John is taller than Mary is.
a. LF: [-er [(than) 1 Mary is <$t_1$-tall>] ] [ 2 John is $t_2$-tall ]
b. $[\![2\ John\ is\ t_2\text{-}tall]\!]^w$ = λd'. tall(j,d')
c. $[\![1\ Mary\ is\ t_1\text{-}tall]\!]^w$ = λd'. tall(m,d')
d. $[\![[\text{-}er\ \ [(than)\ 1\ Mary\ is\ <t_1\text{-}tall>]\ ]\ [\ 2\ John\ is\ t_2\text{-}tall\ ]]\!]$ = 1 iff
∃d [tall(j,d) & ¬tall(m,d)]

■ Semantic type of the *than*-constituent: <d,t> in (33); but type d in (34)-(35).

(34) Al jumped higher than the world record.

(35) Juan es más alto **de** [$_{FreeRC}$ **lo** que lo es María]. Spanish
John is more tall **of** [$_{FreeRC}$ **the** $that_{REL\text{-}PRON}$ it is Mary]
'John is taller than Mary is.'

■ Type conversion from d to <d,t>: the function $SHIFT^{\cdot}_{d\rightarrow<d,t>}$.
This type adjustment may be carried out by an overt element (e.g. *de* 'of' in Spanish) or by a phonologically null element or type-shifter. (Cf. Hackl's (2000:50) BE shifter.)

(36) $SHIFT^{\cdot}_{d\rightarrow<d,t>}$ = λd".λd'. d'≤d"

(37) Al jumped higher than the world record.
a. LF: [$_{DegP}$ -er [the world record] ] [ 2 Al jumped $t_2$-high ]
b. $[\![2\ Al\ jumped\ t_2\text{-}high]\!]$ = λd'. jump-high(a,d')
c. $[\![(than)\ the\ world\ record]\!]$ =$_{e.g.}$ 2,5m
d. $SHIFT^{\downarrow}_{d\rightarrow<d,t>}$ ($[\![the\ world\ record]\!]$) = λd'. d'≤2,5m
e. $[\![[\text{-}er\ \ (than)\ the\ world\ record]\ ]\ [\ 2\ Al\ jumped\ t_2\text{-}high\ ]]\!]$ = 1 iff
∃d [ jump-high(a,d) & ¬(d ≤ 2,5m) ]

■ In this talk, we will assume that a parallel type conversion from <d,t> to <<d,t>,t> is available for superlative constructions: the function $SHIFT^{\cdot}_{<d,t>\rightarrow<<d,t>,t>}$.[2]

(38) $SHIFT^{\cdot}_{<d,t>\rightarrow<dt,t>}$ = $\lambda D_{<d,t>}.\lambda D'_{<d,t>}.\ \exists d"\ [D(d") \& D'= \lambda d'.d'\leq d"]$

[2] For another potential avenue to circumvent the mismatch in modal superlatives, see Howard's (2011) analysis of sentences like (i):
(i) John read the most books that anyone has ever read

## 3. Proposal: A Compositional Analysis of the Modal Superlative Reading

■ Recall that we want to derive the modal superlative reading of e.g. (39) compositionally, using the standard lexical entries in (40)-(41).

(39) John climbed the highest possible mountain.
Modal superlative reading: "He climbed as high a mountain as it was possible for him (/one) to climb".

(40) $[\![\textit{-est}]\!] = \lambda\mathbf{Q}_{<dt,t>}.\lambda P_{<d,t>}.\ \exists d\ [\ P(d)\ \&\ \forall Q \in \mathbf{Q}\ [Q \neq P \rightarrow \neg Q(d)]\ ]$

(41) $[\![\textit{possible IP}]\!]^w = 1$ iff $\exists w' \in Acc_w$: $[\![IP]\!]^{w'} = 1$ [Abbreviated as $\Diamond\phi$ ]

■ Two key ingredients of the proposal:

- Larson's (2000) constituent *[1 possible ▲$_{ACD}$]* is interpreted as an amount relative clause, i.e., as a relative clause ranging over degrees (Carlson 1977, Heim 1987, Grosu and Landman 1998).

(42) [$_{ReducedRC}$ 1 possible <for him/one to climb a $t_1$-high mountain>]

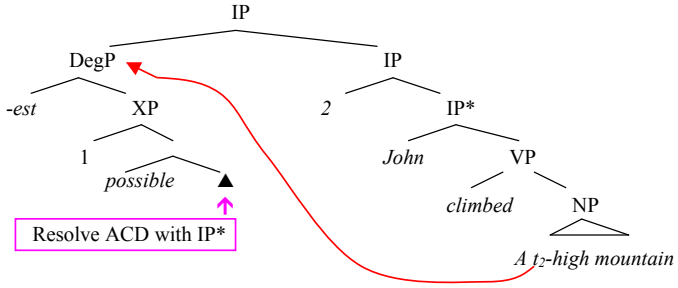
- The constituent *[1 possible ▲$_{ACD}$]* overtly expresses the comparison class argument of *–est*:

(43) a. John is taller.
b. John is taller [than Mary is].

(44) [$_{DegP}$ -est [1 possible ▲$_{ACD}$] ]

■ Sample derivation:

(45) John climbed the highest possible mountain.

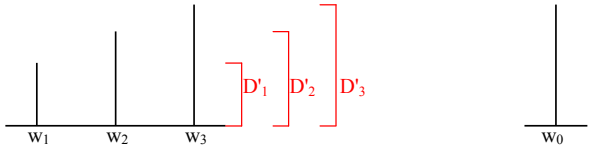





(46) [-est [1 possible <John climbed A $t_1$-high mount>]] [2 John climbed A $t_2$-high mount]

(47) a. $[\![\textit{2 John climbed A } t_2\textit{-high mountain}]\!]$ =
$\lambda d.\ \exists x\ [\text{mount}(x)\ \&\ \text{climb}(j,x)\ \&\ \text{high}(x,d)]$
b. $[\![\textit{<for John to climb A } t_1\textit{-high mountain>}]\!] = 1$ iff
$\exists x\ [\text{mount}(x)\ \&\ \text{climb}(j,x)\ \&\ \text{high}(x,g(1))]$
c. $[\![\textit{possible <for John to climb A } t_1\textit{-high mountain>}]\!] = 1$ iff
$\Diamond\exists x\ [\text{mount}(x)\ \&\ \text{climb}(j,x)\ \&\ \text{high}(x,g(1))]$
d. $[\![\textit{1 possible <for John to climb A } t_1\textit{-high mountain>}]\!]$ =
$\lambda d.\ \Diamond\exists x\ [\text{mount}(x)\ \&\ \text{climb}(j,x)\ \&\ \text{high}(x,d)]$
e. $\text{SHIFT}^{*}_{<d,t>\rightarrow<dt,t>}([\![\textit{1 possible <for John to climb A } t_1\textit{-high mountain>}]\!])$ =
$\lambda D'_{<d,t>}.\ \exists d'\ [\ \Diamond\exists x[\text{mount}(x)\ \&\ \text{climb}(j,x)\ \&\ \text{high}(x,d')]\ \&\ D'=\lambda d''.d''\leq d'\ ]$
f. $[\![(46)]\!] = 1$ iff
$\exists d\ [\ \exists x[\text{mount}(x)\ \&\ \text{climb}(j,x)\ \&\ \text{high}(x,d)]\ \&$
$\forall D'\ [\ (\exists d'\ [\Diamond\exists x[\text{mount}(x)\ \&\ \text{climb}(j,x)\ \&\ \text{high}(x,d')]\ \&\ D'=\lambda d''.d''\leq d']$
$\&\ D' \neq \lambda d.\exists x[\text{mount}(x)\ \&\ \text{climb}(j,x)\ \&\ \text{high}(x,d)])\rightarrow\neg D'(d)]\ ]$

(48)




## 4. Reconciling the Three Empirical Restrictions

■ By combining Larson's (2000) and Schwarz's (2005) structures into the new parse in (49), the proposed compositional account inherits the benefits of the two previous syntactic approaches and allows us to derive the three empirical restrictions observed.

(49) [-est [1 possible ▲$_{nonfinite}$] ]

■ Restriction ③: Locality requirement between *-est* and the modal adjective.
*[(1) possible ▲]* is not a modifier of the head noun, but the comparison class argument of *est*, as in (49).
↳ As long as *[possible ▲]* remains in based-generated position, no adjective can intervene between it and *–est*: (50)-(52).
↳ Assuming that all and only noun modifiers agree with the head noun in German, the pattern is derived: (53)-(55).

(50) a. * [$_{NP}$ Det Adj + [$_{DegP}$ -est **Adj** [1 possible ▲$_{ACD}$]] N ]
b. ✓ [$_{NP}$ Det Adj + [$_{DegP}$ -est [1 possible ▲$_{ACD}$]] **Adj** N ]

(51) I bought the largest **affordable** possible present. (=(16)))
✓Regular modifier *Modal superlative

(52) I bought the largest possible **inexpensive** present.
✓Regular modifier ✓Modal superlative

(53) NP structure for German:
a. Regular modifier reading: [$_{NP}$ Det Adj-Infl possible-Infl N ]
b. Modal superlative reading: [$_{NP}$ Det [Adj [-est 1 possible ▲$_{ACD}$]]-Infl N ]

(54) Ich habe das größt.**e** möglich.**e** Geschenk gekauft. (=(14))
I have the largest.**Infl** possible.**Infl** present gekauft REGULAR MODIFIER

(55) Ich habe das größt möglich.**e** Geschenk gekauft. (=(15))
I have the largest possible.**Infl** present gekauft MODAL SUPERLATIVE

■ RESTRICTION ②: Postnominal *possible*.
If *possible* is treated as a simple regular modifier with no elided IP, *possible* is "light" and thus is not allowed to postpose, as in (56). If *possible* is understood as introducing a reduced relative clause with an elided IP, the constituent is "heavy" and it is allowed to postpose, as in (57).[3]

(56) a. [$_{NP}$ Det [Adj+est] [possible] N ]
b. [$_{NP}$ Det [Adj+est] t N ] [possible]

(57) a. [$_{NP}$ Det Adj + [$_{DegP}$ -est [1 possible ▲$_{ACD}$]] N ]
b. [$_{NP}$ Det Adj + [$_{DegP}$ -est t ] N ] [1 possible ▲$_{ACD}$]

(58) John bought the largest present **possible**. *REGULAR MODIFIER ✓MODAL SUPERL

■ RESTRICTION ①: Lexical restriction.
Following Larson (2000), the modal superlative reading involves an elided nonfinite clause as complement of the modal adjective. Hence, only modal adjectives that can take a nonfinite complement clause give rise to the modal superlative reading.

(59) a. It is possible / imaginable / conceivable [PRO / for John to interview that candidate].
b. * It is potential / probable [PRO / for John to interview that candidate]. (=(18))

(60) John bought the largest **possible** / **imaginable** / **conceivable** / **#potential** / **#probable** present.

[3] Note that a third logical possibility remains: one could in principle treat *possible* as a reduced relative clause with an elided IP ranging not over degrees ((ia)) but over individuals ((ib)), thus "heavy"
(i) John bought the largest present possible
a Reading over degrees (= modal superlative reading): 'John bought a present large to a degree that is the greatest degree d such that it was possible for John to buy a d-large present '
b Reading over individuals: 'John bought the largest one among the presents x such that it was possible for John to buy x '
It is not clear to me whether (ib) is a possible reading of (i) (or of its prenominal counterpart) Note that, if that reading were available, one would expect for it to arise regardless of the superlative, that is, regardless of whether there is degree quantification or not However, when we remove *-est*, a reduced relative clause ranging over individuals does not tolerate IP ellipsis: (iia,b) are acceptable, but ellipsis leads to unacceptability in (iic)
(ii) a I bought a present that it was possible for me to buy
b I bought a present possible for me to buy
c * I bought a present possible



## 5. TESTING FURTHER PREDICTIONS OF THE PROPOSAL

### 5.1. Shape of the recovered ellipsis site

■ Paraphrase "as X as possible for him / one to …":

(61) John climbed the highest possible mountain.
"He climbed as high a mountain as it was possible for him / one to climb".

(62) a. *[possible for him$_i$ to buy]* ⇨ "as X as possible for him to …"
b. *[possible for PRO$_{ARB}$ to buy]* ⇨ "as X as possible for one to …"

■ PREDICTION: The paraphrase "as X as possible for him to …" corresponds to a genuine reading of the sentence. Borne out!: (64)-(65).

(63) [-est [1 possible **<for John$_i$(/him$_i$) to climb A t$_1$-high mountain>**]] [2 John$_i$ climbed A t$_2$-high mountain]

(64) Scenario: the host must talk to at least 20 guests and the speaker must talk to at least 5 guests.

(65) I talked to the fewest guests possible, and so did the host.
✓Sloppy reading: "I talked to as few guests as it was possible for me to talk to (namely, 5), and the host talked to as few guests as it was possible for the host to talk to (namely, 20)."

■ OPEN ISSUE: Does the paraphrase "as X as possible for one to …" correspond to a genuine reading of the sentence?
In all examples so far, the generic paraphrase could be constructed as a sub-case of the truth-conditions resulting from (62a) (e.g. the allowed limit is the same for all climbers). To make this paraphrase a separate, genuine reading of the sentence, we would need to allow for vehicle change between a name and PRO$_{ARB}$. Is this permitted? Cf. (66).

(66) John kissed Mary, but I wonder who Harry did ~~kiss t~~.
(Fiengo and May 1994:219, attributed to Wyngaerd-Zwart)

### 5.2. Ellipsis size: Relative and absolute modal superlative readings

■ Relative and absolute readings in simple superlative sentences:

(67) John climbed the highest mountain.
a. Relative reading:
LF: [ **[-est C]** [1[JOHN$_F$ climbed A t$_1$-high mountain]] ~ C ]
'John climbed a higher mountain that anybody else climbed.'
b. Absolute reading:
LF: John climbed THE 2 [ **[-est C]** [1[ t$_{2,F}$ t$_1$-high mountain]]~C ]
'John climbed the mountain that is higher than any otehr mountain.'

■ PREDICTION: As long as the ellipsis site can be properly recovered, we predict modal superlative readings parallel to the relative and absolute readings to be available, as sketched in (68). Borne out!: (69)-(72).

(68) John climbed the highest mountain possible.
a. Modal superlative reading parallel to the relative reading:
LF: [**[$_{DegP}$ -est 1 possible <for John/PRO$_{ARB}$ to climb A $t_1$-high mountain>]** [2 John climbed A $t_2$-high mountain]]
'John climbed as high a mountain as it was possible for him/one to climb.'
b. Modal superlative reading parallel to the absolute reading:
LF: John climbed the 3 [ **[$_{DegP}$ -est 1 possible <$t_3$/PRO$_{ARB}$ $t_1$-high mountain>]** 2 $t_3$ $t_2$-high mountain ]
'John climbed the mountain that is as high as it is possible for it/a mountain to be.'

(69) Pina knows how to organize the little time she has. She solved in five minutes the hardest problem possible, left the harder problems untouched, and then ran for the bus.

(70) Pina is a genius!!! She solved in (just) five minutes the hardest (math) problem possible.

(71) The most beautiful poem possible is Neruda's *Canción Desesperada*.
a. */# 'A poem that is as beautiful as it is possible for that beautiful a poem to equal Neruda's *CD* equals Neruda's *CD*.'
b. 'The poem that is as beautiful as it is possible for it / a poem to be equals Neruda's *CD*.'

(72) *War and Peace* and the most boring novel possible are of equal length.
a. */# '*War and Peace* and a novel that is as boring as it is possible for War and Peace and that boring a novel to be of equal length are of equal length.'
b. '*War and Peace* and the novel that is as boring as it is possible for it / a novel to be are of equal length.'

■ OPEN ISSUE. Two main approaches to relative and absolute readings of simple superlative sentences: the *est*-scoping approach in §2.1 (Heim 1999) and the pragmatic approach in (73) (Sharvit & Stateva 2002). The *est*-scoping account can also derive parallel readings in modal superlative sentences, as in (68a,b). Can the pragmatic approach do that too?

(73) Main ingredients of pragmatic approach:
*Est* always stays within its host DP, though the host DP can scope out at LF.
The pragmatic resolution of *C* determines the relative vs. absolute reading.

(74) a. [ the$_C$ IDENT-W* [-est high mountain] ]
b. "The unique property P which is a member of C and which in every world in W* has the same value as the property of being the highest mountain."

(75) John talked to the most guests possible ▲ / he could ▲.
[the [1possible ▲] / [that he could ▲] IDENT-W* [-est many guests]] 3 [John talked to $T_{3,<e,t>}$]]
⇨ Funny syntax: syntactic material (adj, RC) as contextual restrictor of the determiner.



(76) John talked to the students that Mary refused to.
a. LF: [the[that M refused to ▲] IDENT-W* [students]] 3 [John talked to $T_{3,<e,t>}$]]
b. [[*that$_1$ Mary refused to <talk to $T_1$>*]] =$_{e.g.}$ {"be students", "be professors", "be secretaries"}
c. [[*the[that M refused to <talk to T>] IDENT-W* [students]*]] =$_{e.g.}$ "be students"
d. "John talked to students, whom Mary refused to talk to."
⇨ Not an actual reading of the sentence.

## 6. CONCLUSIONS

■ An analysis of the modal superlative reading has been presented that:

**(i)** compositionally derives the truth conditions "as X as possible" while maintaining standard lexical entries for *-est* and *possible*;

**(ii)** reconciles the empirical restrictions observed for this reading, namely:
- RESTRICTION ③: Locality requirement between *-est* and the modal adjective. *[-est [ possible ▲]]* is a syntactic unit.
- RESTRICTION ②: Postnominal *possible*. The modal superlative reading involves a modal adjective with an complement clause, which makes the AdjP heavy and can thus be postposed.
- RESTRICTION ①: Lexical restriction. The modal superlative reading requires the modal adjective to take a nonfinite complement clause.

**(iii)** and makes further correct predictions with respect to:
- the shape of the recovered ellipsis site: "as X as possible for him to"; and
- the size of the ellipsis: relative and absolute modal superlative readings.

■ Truth-conditions with "at least" vs. "exactly".
The proposed semantics derives the "at least" reading in (77a). The stronger, "exactly" reading could be derived as an implicature, as standardly assumed for "as…as" comparatives, as in (78) (von Stechow 1984). Note that some implicatures are hard or impossible to defeat, as in (79) (cf. Ippolito 2003, Magri 2009).

(77) John climbed the highest possible mountain.
a. "John climbed at least as high a mountain as it was possible/allowed for him to climb."
b. "John climbed as high a mountain as it was possible/allowed for him to climb and no higher."

(78) a. John is as tall as Mary.
b. (Of course) John is as tall as Mary. In fact, he is taller.

(79) a. (Of course) John climbed the most mountains possible. #? In fact, he climbed more than the maximum allowed.
b. (Of course) John climbed as many mountains as possible (/he was allowed to). #? In fact, he climbed more than the maximum allowed.

## REFERENCES


Beaver, David and Brady Clark. 2003. *Always* and *only*: why not all focus-sensitive operators are alike. *Natural Language Semantics* 11: 323-362.

Carlson, Greg. 1977. Amount relatives. *Language* 53: 520-542.

Corver, Norbert. 1997. Much-support as last resort. *Linguistic Inquiry* 21: 119-164.

Fiengo, Robert and Robert May. 1994. *Indices and identity*. Cambridge, MA: MIT Press.

Grosu, Alexander and Fred Landman. 1998. Strange relatives of the third kind. *Natural Language Semantics* 6: 125–170.

Hackl, Martin. 2000. Comparative quantifiers. Ph.D. dissertation, MIT.

Heim, Irene. 1987. Where does the definiteness restriction apply? Evidence from the definiteness of variables. In E. Reuland and A. ter Meulen, eds., *The representation of (in)definiteness*, 21–42. Cambridge, MA: MIT Press.

Heim, Irene. 1999. Notes on superlatives. MIT lecture notes.

Heim, Irene. 2006. Little. In *Proceedings of SALT 16,* ed. M. Gibson and J. Howell, 35-58. Ithaca, NY: CLC Publications.

Howard, Edwin. 2011. *The most* alternative analysis of superlative NPIs *ever*. Talk at the Workshop on degree semantics and its interfaces (Satellite to SuB16), September 5, 2011.

Ippolito, Michela. 2003. Implicatures and presuppositions in counterfactuals. *Natural Language Semantics* 11: 145-186.

Larson, Richard. 2000. ACD in AP? Paper presented at WCCFL 19, February 4-6, UCLA.

Magri, Giorgio. 2009. A theory of individual-level predicates based on blind mandatory scalar implicatures: constraint promotion for Optimality Theory. Ph.D. dissertation, MIT.

Rooth, Mats. 1992. A theory of focus interpretation. *Natural Language Semantics* 1: 75-116.

Romero, Maribel. 2010. Decomposing modal superlatives. Talk at NELS 41, University of Pennsylvania, October 22-24, 2010. (To appear in *Proceedings of NELS 41*. Amherst, Mass.: GLSA.)

Rullmann, Hotze. 1995. *Maximality in the semantics of wh-constructions*. Ph.D. dissertation, University of Massachusetts at Amherst.

Schwarz, Bernhard. 2005. Modal superlatives. In *Proceedings of SALT 15*, E. Georgala and J. Howell, eds., 187-204. Ithaca, NY: CLC Publications.

Seuren, P. A. M. 1973. The comparative. In *Generative grammar in Europe*, ed. F. Kiefer and N. Ruwet, 528-564. Dordrecht: Reidel.

von Stechow, Arnim. 1984. Comparing semantic theories of comparison. *Journal of Semantics* 3: 1-77.

Szabolcsi, Anna. 1986. Comparative superlatives. In *Papers in theoretical linguistics* (MITWPL 8), ed. N. Fukui et al., 245-265. Cambridge, MA: MIT.


## APPENDIX

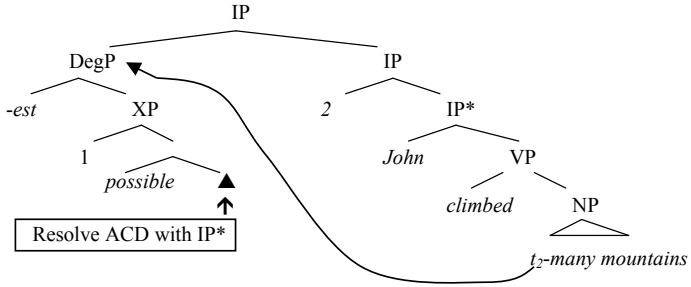
■ Sample derivation with *most* (= *many* + *est*)

(80) $[\![many]\!] = \lambda d_d.\ \lambda P_{<e,t>}.\lambda Q_{<e,t>}.\ \exists x\ [\ |x| \geq d\ \&\ P(x)=1\ \&\ Q(x)=1]$

[Slightly modified from Hackl (2000:83)]



(81) John climbed the **most** possible mountains.




(82) [-est [1 possible <John climbed $t_1$-many mounts>]] [2 John climbed $t_2$-many mounts]

(83) a. $[\![2\ John\ climbed\ t_2\text{-}many\ mountains]\!] = \lambda d.\ \exists x\ [*\text{mount}(x)\ \&\ \text{climb}(j,x)\ \&\ |x| \geq d]$

b. $[\![1\ possible\ \langle John\ climbed\ t_1\text{-}many\ mountains\rangle]\!] = \lambda d.\Diamond\exists x[*\text{mount}(x)\ \&\ \text{climb}(j,x)\ \&\ |x| \geq d]$

c. $\text{SHIFT}'_{<d,t>\rightarrow<dt,t>}([\![1\ possible\ \langle for\ John\ to\ climb\ t_1\text{-}many\ mountains\rangle]\!]) = \lambda D'_{<d,t>}.\ \exists d'\ [\ \Diamond\exists x[*\text{mount}(x)\ \&\ \text{climb}(j,x)\ \&\ |x| \geq d']\ \&\ D'=\lambda d''.d'' \leq d'\ ]$

d. $[\![(82)]\!] = 1$ iff

$\exists d\ [\ \exists x\ [*\text{mount}(x)\ \&\ \text{climb}(j,x)\ \&\ |x| \geq d]\ \&$

$\forall D'\ [\ (\exists d'\ [\Diamond\exists x[*\text{mount}(x)\ \&\ \text{climb}(j,x)\ \&\ |x| \geq d']\ \&\ D'=\lambda d''.d'' \leq d']\ \&$

$D' \neq \lambda d.\exists x[*\text{mount}(x)\ \&\ \text{climb}(j,x)\ \&\ |x| \geq d])\ \rightarrow \neg D'(d)\ ]\ ]$

↳ That is, the set of mountain-amounts (83a) that John actually climbed contains a degree that no other allowed set of degrees in the comparison class (83c) contains.

■ Sample derivation of the modal superlative reading parallel to the absolute reading:

(84) John climbed the highest mountain possible.

a. 'John climbed the mountain that is as high as it is possible <u>for it / anything to be that high a mountain</u>.'

(85) LF: John climbed the 3 [[-est 1 possible **<$t_3$ $t_1$-high mountain>**] 2 $t_3$ $t_2$-high mountain]

(86) a. $[\![2\ t_3\ t_2\text{-}high\ mountain]\!] = \lambda d'''.\ \text{mount}(g(3))\ \&\ \text{high}(g(3),d''')$

d. $[\![1\ possible\ \langle t_3\ t_1\text{-}high\ mountain\rangle]\!]=1$ iff $\lambda d.\Diamond[\text{mount}(g(3))\ \&\ \text{high}(g(3),d)]$

c. $\text{SHIFT}'_{<d,t>\rightarrow<dt,t>}([\![1\ possible\ \langle t_3\ t_1\text{-}high\ mountain\rangle]\!]) = \lambda D'_{<d,t>}.\ \exists d'\ [\Diamond[\text{mount}(g(3))\ \&\ \text{high}(g(3),d')]\ \&\ D'=\lambda d''.d'' \leq d']$

d. $[\![[\text{-}est\ 1\ possible\ \langle t_3\ t_1\text{-}high\ mountain\rangle]\ t_3\ t_2\text{-}high\ mountain]\!]= 1$ iff

$\exists d\ [\ \text{mount}(g(3))\ \&\ \text{high}(g(3),d)\ \&$

$\forall D'_{<d,t>}\ [\ (\exists d'[\Diamond[\text{mount}(g(3))\ \&\ \text{high}(g(3),d')]\ \&\ D'=\lambda d''.d'' \leq d']\ \&$

$D' \neq [\lambda d'''.\text{mount}(g(3))\ \&\ \text{high}(g(3),d''')])\ \rightarrow \neg D'(d)\ ]\ ]$

e. $[\![(85)]\!] = 1$ iff

John climbed the mountain x such that: $\exists d\ [\ \text{mount}(x)\ \&\ \text{high}(x,d)\ \&$

$\forall D'_{<d,t>}\ [\ (\exists d'[\Diamond[\text{mount}(x)\ \&\ \text{high}(x,d')]\ \&\ D'=\lambda d''.d'' \leq d']\ \&$

$D' \neq [\lambda d'''.\text{mount}(x)\ \&\ \text{high}(x,d''')])\ \rightarrow \neg D'(d)\ ]\ ]$