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Introduction to Superlatives

(Heim 1999)

1. Introduction.

■ Some background assumptions:

- Tall(x,d) is understood as "x is at least d-tall". That is, we assume that the meanings of gradable adjectives like *tall* are downward monotonic:

(1) A relation R between objects and degrees is downward monotonic iff:
$\forall x,d,d'$ [R(x,d) & d>d' $\rightarrow$ R(x,d')]

■ Towards a semantics for the superlative

- Seuren's analysis of the comparative:

(2) a is taller than b $\Leftrightarrow$ a is tall to a degree to which b is not
$\Leftrightarrow$ $\exists d$ [tall(a,d) $\wedge \neg$tall(b,d)]

- Extending Seuren's analysis to the superlative: *tall+est* as "taller than everything else"

(3) tallest (a) $\Leftrightarrow$ a is taller than everything else
$\Leftrightarrow$ a is tall to a degree to which nothing else is tall
$\Leftrightarrow$ $\exists d$ [tall(a,d) $\wedge$ $\forall y[y \neq a \rightarrow \neg$tall(y,d)]]

■ Lexical entry for the superlative morpheme *-est*:

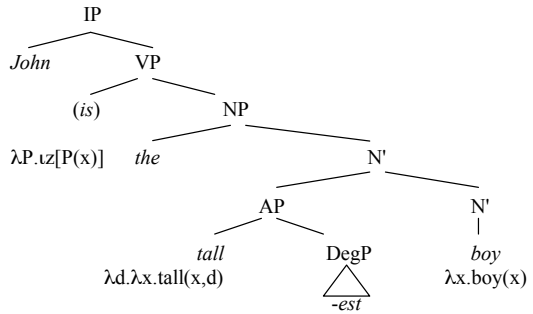
(4) Trial 1:
$[\![\text{-}est]\!]$ = $\lambda R_{<d,et>}\lambda x_e.\ \exists d$ [R(d)(x) & $\forall y[y \neq x \rightarrow \neg R(d)(y)]$]

QUESTION 1: Assume the rule of Predicate Modification in (5) to combine adjectives in prenominal position with their nouns. Which of the two syntactic representations below derives the correct meaning? Why?

(5) Predicate Modification:
If α has the form α (with β and γ), and β and γ are both in $D_{<e,t>}$,
then $[\![\alpha]\!]^w$ = $\lambda x \in D_e.\ [\![\beta]\!]^w(x)=1 \wedge [\![\gamma]\!]^w(x)=1$

(6) John is the tallest boy

(7)



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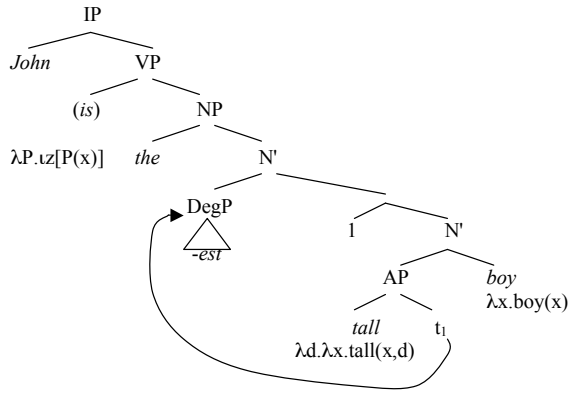


- Second trial: adding context dependency

(9) Hans is groß. Petra is auch groß. Aber Jan ist am größtens.

(10) All of these candidates are acceptable. But John is most impressive. (Heim 1999)

(11) Trial 2:
$[\![\text{-}est]\!]$ = $\lambda C_{<e,t>}.\lambda R_{<d,et>}.\lambda x_e.\ \exists d$ [R(d)(x) & $\forall y[y \neq x$ & $y \in C \rightarrow \neg R(d)(y)]$]

NOTE: Even in the case of prenominal adjectives we will need the context dependency variable C. See later.

- Third trial: adding presuppositions

(12) Final version:
$[\![\text{-}est]\!]$ = $\lambda C_{<e,t>}.\ \lambda R_{<d,et>}$ [$C \subseteq \{z:\exists d''\ R(d'')(z)\}$]. λx_e[$x \in C$].
$\exists d$ [R(d)(x) & $\forall y[y \neq x$ & $y \in C \rightarrow \neg R(d)(y)]$]

2. Absolute superlatives and "comparative" superlatives.

- Example (13) has two readings (Ross 1964; see also Heim 1985, Szabolsci 1986): an absolute reading and a "comparative" reading.

(13) John climbed the highest mountain.
  a. Absolute reading:
     "John climbed Mount Everest."
  b. Comparative reading:
     "The/a mountain that John climbed is higher than the mountains climbed by the other (relevant) people."

- Are these different readings due to context-dependency or to LF structural ambiguity?

  - Context dependency, almost "in situ" approach:
    - Superlative constructions –like any quantificational structure-- carry a hidden indexical C, which somehow restricts the domain of quantification.
    - The two readings in (13) are entirely derivable from the availability of different choices for the value of C.
    - The superlative DegP –*est* is (almost) interpreted in situ. Only some minimal movement is needed for independent interpretive reasons. In any case, the readings in (13) do not depend on the position of –*est*.

  - LF structural ambiguity, -*est* movement approach:
    - Superlative constructions –like any quantificational structure-- carry a hidden indexical C, which somehow restricts the domain of quantification.
    - The LF position of –*est* has an impact on the availability of the two readings in (13), in that it determines possible choices for the value of C.
    - The superlative DegP –*est* can be interpreted (almost) in situ –exactly as in the previous approach— or displaced.

  ⇒ Note that the set of LFs and semantic interpretations that the movement approach can generate is a superset of the ones that the in situ approach would generate

- Furthermore, different comparative readings can be obtained depending on the placement of Focus intonation.

(14) a. John put the tallest plant [on the TAble]$_F$.
     b. [JOHN]$_F$ put the tallest plant on the table.

- How can the role of Focus be accounted for?

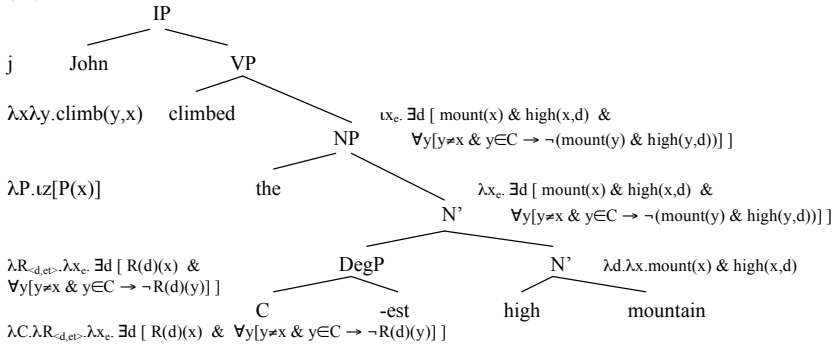
3. Approach 1: context-dependency, -*est* in situ.

- Thesis: -*est* is (almost) interpreted in situ. The different readings of (15) derive entirely from the choice of the value of C.

(15) John climbed the highest mountain.
  a. Absolute reading:
     "Out of the set of (relevant) mountains, John climbed the highest one."
  b. Comparative reading:
     "The/a mountain that John climbed is higher than the mountains climbed by the other (relevant) people."
     ≈ "Out of the set of mountains climbed by the (relevant) set of people, John climbed the highest."

- Example:

(16) climb (j, ιx_e. ∃d [mount(x) & high(x,d) & ∀y[y≠x & y∈C → ¬(mount(y) & high(y,d))]])



(17) a. Absolute reading: C = {x: x is a mountain on earth}
     b. Comparative reading: C = {x: x is a mountain climbed by John, Pat or Lucy}

- Examples with Focus: Recall that Focus distinguishes between possible comparative readings. The same happens with other quantificational structures, like (19).

(18) a. John put the tallest plant [on the TAble]$_F$.
     b. [JOHN]$_F$ put the tallest plant on the table.

(19) a. Mary always puts the plant [on the TAble]$_F$.
     b. [Mary]$_F$ always puts the plant on the table.

■ How Focus narrows down the index C in adverbs of quantification:

(20) a. [∪C always] [[λt. Mary at t puts the plant [on the table]$_F$] ~ C]
b. [∪C always] [[λt. [Mary]$_F$ at t puts the plant on the table] ~ C]

(21) [α ~ C] is felicitous only if C is a subset of the Focus semantic value of α, $[\![\alpha]\!]^F$.

(22) Computing Focus semantic values:
a. If α is a terminal node, then $[\![\alpha]\!]^F = \{[\![\alpha]\!]^F\}$.
b. If α is a non-branching node with single daughter β, then $[\![\alpha]\!]^F = [\![\beta]\!]^F$.
c. . If α is a branching node with daughters β and F (Focus feature), then $[\![\alpha]\!]^F = D_\sigma$, where σ is the type of $[\![\beta]\!]$.
d. If α is a branching node with daughters β and γ (order irrelevant), and there are types σ and τ such that $[\![\beta]\!] \in D_{<\sigma,\tau>}$ and $[\![\gamma]\!] \in D_\sigma$, then $[\![\alpha]\!]^F =$
$\{ x \in D_\tau : \exists y \exists z [y \in [\![\beta]\!]^F \ \& \ z \in [\![\gamma]\!]^F \ \& \ x = y(z)] \}$

(23) If we have [[λt. Mary at t puts the plant [on the table]$_F$] ~ C],
it is pressuposed that
C ⊆ { [λt.Mary puts at t the plant on x] : x is a location }.
Hence:
∪C ⊆ { t: Mary puts the plant at t somewhere }

(24) If we have [[λt. [Mary]$_F$ at t puts the plant on the table] ~ C],
it is pressuposed that
C ⊆ { [λt. x puts at t the plant on the table] : $x \in D_e$ }.
Hence:
∪C ⊆ { t: someone puts the plant at t on the table }

■ Back to Focus in Superlatives:

(25) John put the tallest plant [on the TAble]$_F$.
a. LF: [the [∪C –est] [tall plant]] [λx.John put x [on the table]$_F$] ~ C
b. ∪C ⊆ { x: John put x somewhere }
λx. ∃z [location(z) & put(j,x,z)]

(26) [JOHN]$_F$ put the tallest plant on the table.
a. LF: [the [∪C –est] [tall plant]] [λx.[John]$_F$ put x on the table] ~ C
b. ∪C ⊆ { x: someone put x on the table }
λx. ∃z [person(z) & put(z,x,table)]

(27) Context-dependent semantic interpretation for both (25a) and (26a):
Put (j, ιx_e.∃d [plant(x) & tall(x,d) & ∀y[y≠x & y∈C → ¬(plant(y) & tall(y,d))]], the table)

4. Problem for the in situ analysis.

■ Besides several combinations of de re/de dicto with absolute/comparative readings, there is a reading for (28) that is made salient by scenario S. Let's call this reading "**Reading X**".

(28) John wants to climb the highest mountain.

(29) I conducted a survey on how high a mountain people want to climb. All my subjects expressed de dicto desires about mountains.
Mary said: "I want to climb a mountain that is 4000m high".
John said: "I want to climb a mountain that is 6000m high".
Bill said: "I want to climb a mountain that is 1000m high".

■ The in situ approach cannot derive this reading:

(30) LF: John wants λw [PRO to climb$_w$ [THE / A [C_w-est] [high$_w$ mountain$_w$]]]

(31) (30) is felicitous (i.e. has a truth value) only if, for any w :
i. ιx_e.∃d [mount(x,w) & high(x,d,w) & ∀y[y≠x & y∈C_w → ¬(mount(y,w) & high(y,d,w))]] ∈ C_w, and
ii. C_w ⊆ { z: ∃d" [mount(z,w) & high(z,d",w)] }

(32) If (30) has a truth value, then:
[[(30)]] = 1 iff John wants: λw. climb (j, ιx_e. ∃d [mount(x,w) & high(x,d,w) & ∀y[y≠x & y∈C_w → ¬(mount(y,w) & high(y,d,w))]])

(33) Potential value of C_w:
C_w = {x: x is a mountain climbed by Mary, John or Bill in w}
⇨ This does not give us "Reading X", but a comparative desire:
"John's internal thinking: 'I wish I would climb a higher mountain that Mary or Bill would'."

QUESTION 2: Heim (1999) also considers the value in (35). Why is the value for C_w in (35) not suitable to derive Reading X?

(34) For each person x:
S_x := {d: x want to climb a d-high mountain}
That is: S_{Mary} = {1m, 2m, ... 4000}
S_{John} = {1m, 2m, ... 6000}
S_{Bill} = {1m, 2m, ... 1000}

(35) Potential value of C_w:
C_w = {x: x is a mountain in w and ∃d [(d∈S_{Mary} ∨ d∈S_{John} ∨ d∈S_{Bill}) & x is (exactly) d-high in w]}

5. Approach 2: LF structural ambiguity, moved *–est* account.

■ Assumptions:

-est can undergo LF movement out of its host DP. (This movement is island-bound and probably clause bound, like QR.)

The definite article *the* in these constructions is semantically vacuous. Instead, we have a phonologically unrealized Det, which can be definite (THE) or indefinite (A).

Thesis:

Given the lexical meaning of *–est*, the LF position of *–est* determines, to some extent, the possible choices for C and, ultimately, whether we get the absolute or the comparative reading.

(36) $[\![\text{-}est]\!] = \lambda C_{<e,t>}.\ \lambda R_{<d,et>}\,[C \subseteq \{z{:}\exists d''\ R(d'')(z)\}].\ \lambda x_e[x \in C].$
$\exists d\ [\ R(d)(x)\ \&\ \forall y[y \neq x\ \&\ y \in C \rightarrow \neg R(d)(y)]\ ]$

■ The absolute / comparative ambiguity:

(37) John climbed the highest mountain.

(38) *-est* in situ (almost): [as in approach 1]
a. LF: John climbed [THE [C –est] [high mountain]]
b. Absolute reading: C = {x: x is a mountain on earth}
c. Comparative reading: C = {x: x is a mountain climbed by John, Pat or Lucy}

(39) Moved *-est*:
a. LF: John [C –est] $\lambda d \lambda x$[x climbed [A d-high mountain]]
b. $\lambda x.\exists d\ [\ \exists z[\text{mount}(z)\ \&\ \text{high}(z,d)\ \&\ \text{climb}(x,z)]\ \&\ \forall y[y \neq x\ \&\ y \in C \rightarrow \neg(\exists u\ \text{mount}(u)\ \&\ \text{high}(u,d)\ \&\ \text{climb}(y,u)]\ ]$ (j)
c. Due to presuppositions in the lexical entry of *-est*, C has to be a set containing John and other (relevant) climbers of mountains with some degree of height or other.
⇒ Comparative reading.

■ Focus-sensitive comparative readings: we can derive them as in approach 1, or by moving the focused constituent and then tucking in *–est* right below it, as in (41a).

(40) a. John put the tallest plant [on the TAble]$_F$.
b. [JOHN]$_F$ put the tallest plant on the table.

(41) a. LF for (32a): [On the table] [C –est] $\lambda d \lambda x$[John put [A d-tall plant] x]
b. $\lambda x.\exists d\ [\ \exists z[\text{plant}(z)\ \&\ \text{tall}(z,d)\ \&\ \text{put}(j,z,x]\ \&\ \forall y[y \neq x\ \&\ y \in C \rightarrow \neg(\exists u\ \text{plant}(u)\ \&\ \text{tall}(u,d)\ \&\ \text{put}(j,u,y)]\ ]$ (the table)
c. C has to be a set containing the table and some other (relevant) locations where John put a plant of some degree of tallness or other.

■ Reading X:

(42) John wants to climb the highest mountain.

(43) I conducted a survey on how high a mountain people want to climb. All my subjects expressed de dicto desires about mountains.
Mary said: "I want to climb a mountain that is 4000m high".
John said: "I want to climb a mountain that is 6000m high".
Bill said: "I want to climb a mountain that is 1000m high".

(44) Move *–est* outside *want*:
a. LF: John [C –est] $\lambda d \lambda x$[x wants in w_0 λw [PRO to climb$_w$ [A d-high$_w$ mountain$_w$]]]
b. $\lambda x.\ \exists d\ [x \text{ wants in } w_0\ (\lambda w.\exists z\ [\text{mount}(z,w)\ \&\ \text{high}(z,d,w)\ \&\ \text{climb}(x,z,w)])\ \&$
$\forall y[y \neq x\ \&\ y \in C \rightarrow \neg[y \text{ wants in } w_0\ (\lambda w.\exists z\ [\text{mount}(z,w)\ \&\ \text{high}(z,d,w)\ \&\ \text{climb}(y,z,w)])\ ]\ ]\ ]$ (j)
c. C has to contain John and some other (relevant) individuals for which there is some degree d such that they want in w_0 to climb a/any d-high mountain.

■ Tentative conclusion:

As appealing as the in situ analysis is, it is not able to generate Reading X, which the movement approach to *–est* can easily generate. However, the movement approach is highly redundant.