

Comparatives

Adjective meanings:

(1) measure functions (type $\langle e, d \rangle$):
TALL(x) = x's height (a degree)

(2) adjective meanings:

(a) functional:

$$[[\mathbf{tall}]] = \lambda d. \lambda x. \text{TALL}(x) = d$$

(b) relational:

$$[[\mathbf{tall}]] = \lambda d. \lambda x. \text{TALL}(x) \geq d$$

(Hierarchical order of individual and degree arguments might be reversed.)

Degrees:

(3) D_d = the domain of all degrees
subdivides into sorts of degrees, e.g., spatial distances, volumes, weights, cardinalities, temporal distances, degrees of beauty, ...

Not as many sorts as there are adjectives (e.g., **long₁**, **tall**, **wide**, ... all relate to spatial distances, **long₂**, **old** relate to temporal distances, ...).

(4) \geq a reflexive, antisymmetric¹, transitive relation on D_d

Within each sort, \geq is connected (i.e., if d and d' are degrees of the same sort, then $d \geq d'$ or $d' \geq d$). For degrees d and d' of different sorts, we assume that we have neither $d \geq d'$ nor $d' \geq d$.

(5) $+$, \bullet : addition and multiplication operations

$+$ is a partial function from $D_d \times D_d$ into D_d .

\bullet is a partial function from $\mathbb{R}^+ \times D_d$ into D_d . (\mathbb{R}^+ = the positive real numbers)

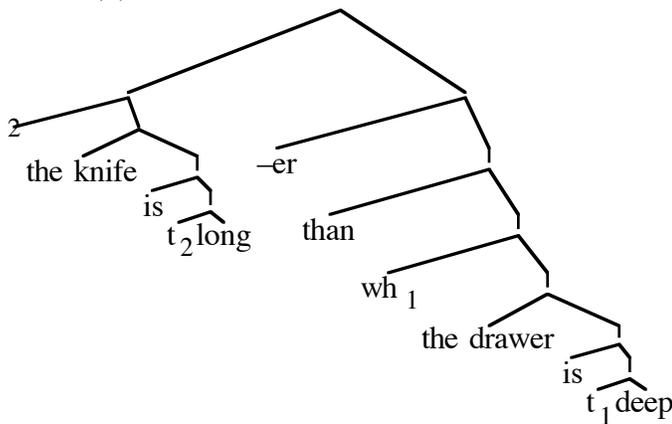
These are defined for certain sorts of degrees, not others.

Comparatives: syntax

(6) Subdeletion is the basic case. Everything else is ellipsis and assumed to look like subdeletion at LF.

¹ Def.: for any d, d' in D_d , if $d \geq d'$ and $d' \geq d$, then $d = d'$.

- (7) The knife is longer than the drawer is deep.
- (8) **than**-clause is a wh-clause with a degree gap.
Degree-gap is trace of an empty operator interpreted as a λ -abstractor.
- (9) **-er** and **than**-clause form a constituent at LF. (**Than**-clause is obligatorily extraposed at PF and **-er** is affixed to the adjective or supported by dummy **much**.)
- (10) **-er** + **than**-clause is moved to a clausal scope at LF and leaves behind a degree variable.
- (11) LF for (7):²



Comparative affix: semantics

- (12) $[[\text{-er}]](T)(M) = 1$ iff
- | | | | |
|--------------|-------------|---|--------------|
| some | | > | some |
| every | degree in M | | degree in T |
| the (unique) | | | the (unique) |
| the maximal | | | the maximal |

2 options for adj meanings and 4 \times 4 options for meaning of comparative. Can we decide which is right?

Atomic, non-quantified sentences in both matrix and than-clause

- (13) functional Adj-meanings: all 4 \times 4 options equivalent and correct

² Let's get used to QRing rightward.

- (14) relational Adj-meanings:
- | | | | | |
|-------------------------|-------------|---|-------------------------|-------------|
| some | | | some | |
| every | degree in M | > | every | degree in T |
| the (unique) | | | the (unique) | |
| the maximal | | | the maximal | |

Complex than-clauses: disjunction

- (15) The knife is longer than the drawer is wide or deep.
 means: 'longer than drawer's width and longer than drawer's depth'
- (16) John is taller than Mary or Sue.
 means: 'taller than Mary and taller than Sue'

- (17) functional Adj-meanings:
- | | | | | |
|--------------|-------------|---|-------------------------|-------------|
| some | | | some | |
| every | degree in M | > | every | degree in T |
| the (unique) | | | the (unique) | |
| the maximal | | | the maximal | |

- (18) relational Adj-meanings:
- | | | | | |
|-------------------------|-------------|---|-------------------------|-------------|
| some | | | some | |
| every | degree in M | > | every | degree in T |
| the (unique) | | | the (unique) | |
| the maximal | | | the maximal | |

Complex than-clauses: existential operators

- (19) I saw more boys than I saw girls.
- (20) [$\square d$. I saw d-many boys] -er(than [$\square d$. I saw d-many girls])
 [$\square d$. $\square x$ [d-many(x) & boys(x) & I saw x]]
 -er(than [$\square d$. $\square x$ [d-many(x) & girls(x) & I saw x]])

- (21) for both functional and relational Adj-meanings:
- | | | | | |
|-----|-------------|---|-------------------------|-------------|
| | | | some | |
| ... | degree in M | > | every | degree in T |
| | | | the (unique) | |
| | | | the maximal | |

- (22) John is taller now than he has ever been.
- (23) The package is heavier than is allowed.
- (24) $[\Box d. j \text{ is } d\text{-tall now}] \text{-er}(\text{than } \Box d. \Box t < \text{now: } j \text{ is } d\text{-tall at } t)$
- (25) $[\Box d. p \text{ is } d\text{-heavy in } @] \text{-er}(\text{than } \Box d. \Box w \Box \text{Acc}(@): p \text{ is } d\text{-heavy in } w)$
- (26) ... degree in M > every degree in T:
correct truth conditions, for either functional or relational Adj-meanings
- (27) ... degree in M > the maximal degree in T:
There may not be any well-defined maxima. (See Pinkal 1988 for this argument.) If John has been growing continuously, his past heights come arbitrarily close to his present height. The post office rule for packages may say: "must be less than 5 lbs".

Complex than-clauses: necessity operator

- (28) The paper is longer than necessary.
- (29) $[\Box d. p \text{ is } d\text{-long in } @]$
 $\text{-er}(\text{than } \Box d. \Box w \Box \text{Acc}(@): p \text{ is } d\text{-long in } w)$
- (30) I have more money than I need.
- (31) $[\Box d. \text{I have } d\text{-much money in } @]$
 $\text{-er}(\text{than } \Box d. \Box w \Box \text{Acc}(@): \text{I have } d\text{-much money in } w)$
- (32) functional Adj-meanings:
... degree in M > ~~every~~ degree in T
~~the maximal~~
- (33) relational Adj-meanings:
... degree in M > every degree in T
the maximal?

Here we have an argument for the relational Adj-meaning.

What about the matrix clause?

So far: given relational adj meanings, we need 'some' or 'the maximal'. Can we decide between these two?

Consider situations where there are no maxima. E.g., I need to get more than 50% of the vote (any infinitesimal amount above 50% will do, but 50% won't). You need to get more than 25%.

(34) I need a higher percentage of the vote than you do.

Three correct and equivalent ways to represent the meaning of (34):

(35) $\exists w \exists \text{Acc}(@)$: some d such that I get a d-high percentage in w >
 every d such that $\exists w \exists \text{Acc}(@)$: you get a d-high percentage in w

(36) $\exists w \exists \text{Acc}(@)$: the maximal d such that I get a d-high percentage in w >
 every d such that $\exists w \exists \text{Acc}(@)$: you get a d-high percentage in w

(37) some d such that $\exists w \exists \text{Acc}(@)$: I get a d-high percentage in w >
 every d such that $\exists w \exists \text{Acc}(@)$: you get a d-high percentage in w

but not:

(38) the maximal d such that $\exists w \exists \text{Acc}(@)$: I get a d-high percentage in w >
 every d such that $\exists w \exists \text{Acc}(@)$: you get a d-high percentage in w

If we can rule out the widest scope 'need' analyses (35) and (36) for an independent reason, we have evidence for the 'some'-version here.

Ellipsis resolution could be such an independent reason: Comparative quantifier must move over 'need' to resolve antecedent-containment.

Summary so far: We seem to need:

- relational adjective meanings,
- 'some' on matrix side of comparative,
- 'every' on the than-clause side of comparative.

However, there are many kinds of examples that point in different directions.

Equatives and differential comparatives with 'exactly'-readings (see again Pinkal 1988)

(39) John is exactly 2" taller than Mary.

(40) John is exactly as tall as Mary.

(41) $[[\text{exactly } 2'' \text{-er}]](T)(M) = 1$ iff
 ... degree in M exceeds every degree in T by exactly 2"
 the maximal

(42) $[[\text{exactly as}]](T)(M) = 1$ iff
 ... degree in M = every degree in T
 the maximal

Here it seems that if we have relational adj meanings, we need 'the maximal' rather 'every'. But it gets worse:

- (43) John is exactly 2" taller than Mary or Sue.
*he is exactly 2" taller than the taller of the two'
'he is exactly 2" taller than Mary and exactly 2" taller than Sue'
i.e., we get an implication that Mary and Sue are the same height

- (44) John is exactly as tall as Mary or Sue.

These examples suggest that we can't have relational adjective meanings at all. The only combination that works for these is functional adj meaning + 'every' for than/as-clause.

However:

- (45) The package is exactly 1 ounce heavier than allowed.
'... than the maximal allowed weight'
- (46) I have exactly \$10 dollars more than I need.
'... than the minimum with which I can get by'

These examples come out right only if we combine relational adj meanings with 'the maximal' for than-clause.

Many more conflicting data when we look at the full range of DP-quantifiers, quantificational adverbs, and intensional operators in the than-clause. (Larson, Schwarzschild & Wilkinson)