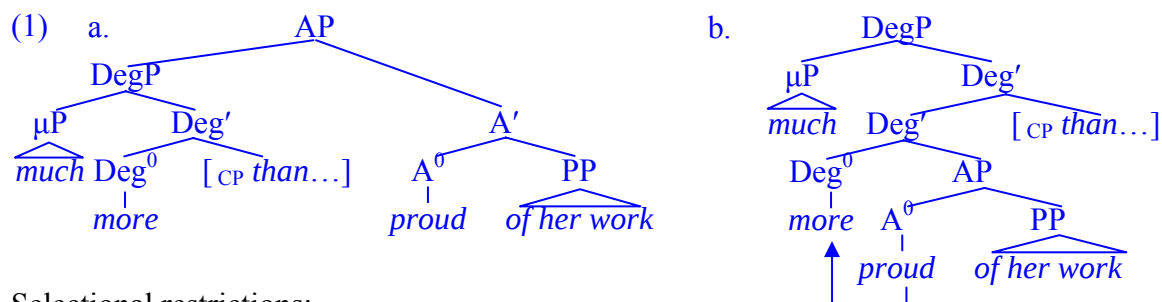


SMS: THE DERIVATION OF COMPARATIVES AT THE INTERFACES

University of Leiden, March 17, 2011

Issue: recent approaches to comparatives, in both compositional semantics and morphology, have moved away from the traditional head-movement analysis.

Depending on who you ask, the comparative morpheme may occur with as many as three arguments (like a ditransitive verb): the **scalar predicate**, the **standard of comparison** and a **measure phrase** (differential or factor phrase – see von Stechow (1984)).



Selectional restrictions:

- c-selection: certain degree morphemes (*as*, *-er*) combine only with adjectives
- l-selection: the exact head of the degree clause/phrase (*than/as*) is determined by the degree morpheme (*more/as*)

While the **semantics** of comparatives argues for a constituency as in (1a) (Bowers (1975), Jackendoff (1977), etc.), their **morphosyntax** suggests that the comparative morpheme and the AP form a syntactic unit to the exclusion of the comparison phrase (as in (1b), following Abney (1987), Bowers (1987), Corver (1990, 1991, 1997a, 1997b)).

Semantics: the comparative morpheme and the comparison clause form a constituent (Heim (2000)). Morphosyntactic properties of synthetic comparatives cannot be accounted for in the resulting structure.

Proposal: restate the lexical meaning of “comparative” morphemes in such a way that degree QR becomes compatible with their morphosyntax

Morphology: since synthetic comparative formation is sensitive to the choice of the adjective and is blocked by an intervening adverb, it cannot be achieved by head movement (Embick and Noyer (1999, 2001), Embick (2007)).

Proposal: the alternative Local Dislocation operation cannot account for the morphosyntax of synthetic comparatives. The copy theory of movement provides a way out.

To summarize, this is an argument for an existential view of comparatives (cf. Seuren (1973), Larson (1988) as opposed to von Stechow (1984))

1. HEIM'S COMPOSITIONAL SEMANTICS OF COMPARATIVES

As is well-known, scalar predicates are treated via an additional argument slot, that of degree (Seuren (1973), Cresswell (1976), Hellan (1981), von Stechow (1984), Heim (1985, 1994), Kennedy (1997/1999), Bhatt and Pancheva (2004), etc.):

(2) $\llbracket \text{tall} \rrbracket = \lambda d \in D_d . \lambda x \in D_e . x \text{ is tall to the degree } d$

Scalar predicates are downward monotonic:

(3) A function f of type $\langle d, \langle e, t \rangle \rangle$ is *downward monotonic* iff $\forall x \forall d \forall d' [f(d)(x) = 1 \ \& \ d' < d \rightarrow f(d')(x) = 1]$

1.1. Degree QR

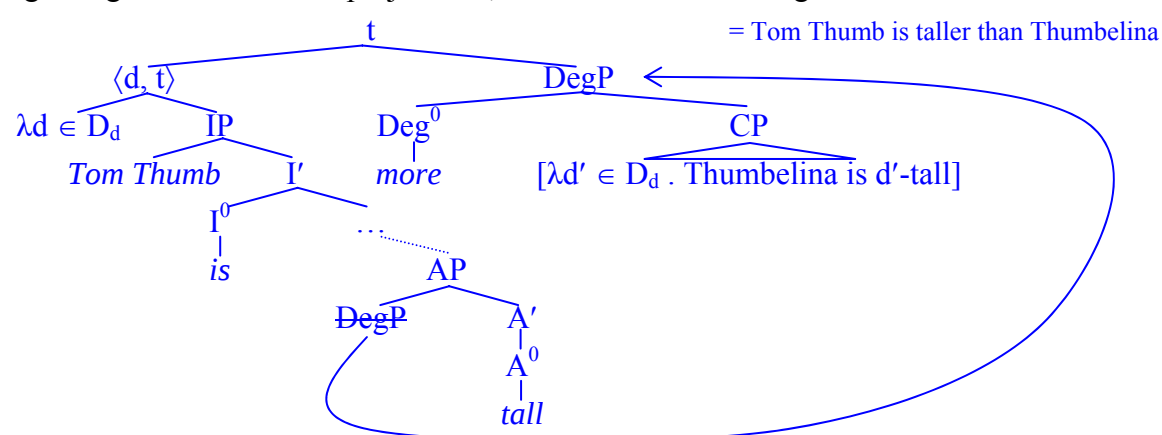
Assuming that the comparative clause denotes a degree predicate:

- (4) $\llbracket \text{more than } g \rrbracket = \lambda f \in D_{\langle d, t \rangle} . \max (f) > \max (g)$
where $\max (P) = \text{id} \in D_d . P(d) = 1$ and $\forall d' \in D_d [P(d') = 1 \rightarrow d' \leq d]$

As a result, **the comparative morpheme** cannot be interpreted *in situ* and **must QR**:

- (5) 

Disregarding all non-essential projections, we obtain the following structure:

- (6) 

The comparative morpheme + comparative clause complex must raise **at least as high as the first t-type node**, where λ -abstraction over degrees ensures its interpretability.

1.2. Evidence for operator movement

Bresnan (1973, (1975): comparatives involve PF-deletion

Chomsky (1977), Milner (1978): **than-clauses involve wh-movement of a null operator**

NB: Pinkham (1982): ellipsis resolution in comparatives requires an interpretative approach

1.2.1. Cross-over

Ross (1967), Postal (1971): movement cannot cross over a co-referring pronoun:

- (7) a. The students who_i thought they_i would flunk _____i didn't flunk.
b. *The students who_i thought _____i would flunk they_i didn't flunk.
(8) a. More students_i flunked than _____i thought they_i would (flunk).
b. *More students_i flunked than they_i thought _____i would (flunk).

1.2.2. Islands

Ross (1967): certain configurations are islands for extraction (exx. from Bresnan (1975)):

- (9) a. *How hard did you believe the claim that these problems would be? complex NP
b. *Wilt is taller than he knows a boy who is ____.
(10) a. *How hard do you consider these problems ____ and onerous? coordinate structure
b. *Wilt is taller than Bill is strong and ____.

- (11) a. *How hard is [that they will be ____] likely? sentential subject
b. *Wilt is taller than [that he is ____] is generally believed.

1.2.3. Interaction with ellipsis

Williams (1974), Heim (2000):

- (12) a. My father tells me to work harder than my boss does.
b. My father tells me to work harder than my boss does ~~work t-hard~~.
c. My father tells me to work harder than my boss does ~~tell me to work t-hard~~.

1.2.4. ACD

English quantified DPs may appear in apparent infinite regression structures:

- (13) a. Fred has bought every book that Ned has.
b. Dora will see no movie that Nora has.

To obtain the antecedent for VP-ellipsis in the relative clause, the quantified DP moves to its scope position (Sag (1976), Larson and May (1990), etc.):

- (14) a. [every book that Ned has ____]_i Fred has bought t_i. QR
b. [every book that Ned has ~~bought t_j~~]_i Fred has bought t_i. ellipsis resolution

Evidence that QR is involved: bare plural NPs cannot license ACD:

- (15) a. *Fred was climbing trees that Jill was.

However, bare plurals modified by a comparative can **license ACD**:

- (16) a. Fred was climbing more trees than Jill was.
b. Fred was climbing higher trees than Jill was.

Degree operators must license movement (Wold (1995) via Heim (2000)).

1.2.5. Inversion

Milner (1978): the movement of the null operator inside the degree clause is confirmed by the availability of stylistic inversion in French, which, furthermore, takes place cyclically:

- (17) a. Pierre a plus de livres que n' en a Paul.
Pierre has CMPR of books CMPZR NEG PART.CL has Paul
Pierre has more books than Paul does.
b. Il est aussi triste que l' était Jeanne hier.
he is EQ sad CMPZR PRED.CL was Jeanne yesterday
He is as sad as Jeanne was yesterday.

Stylistic inversion indicates movement.

NB: Note that stylistic inversion only happens in the degree clause

1.3. **Scope interactions with other quantifiers**

Kennedy (1997/1999): if the degree operator moves, it should be able to take scope over other operators. Such readings are in fact not attested (see Heim (2000)):

- (18) John is 4 feet tall. Every girl is exactly 1 inch taller than that.
a. $\forall > -er: \forall x [\text{girl}(x) \rightarrow \max \{d: \text{tall}(x,d)\} = 4' + 1']$
b. $*-er > \forall: \max \{d: \forall x [\text{girl}(x) \rightarrow \text{tall}(x,d)\} = 4' + 1']$

The reading in (18b), where the shortest girl is one inch taller than John and the rest are taller, is not available

(19) Kennedy's generalization (Heim (2000)):

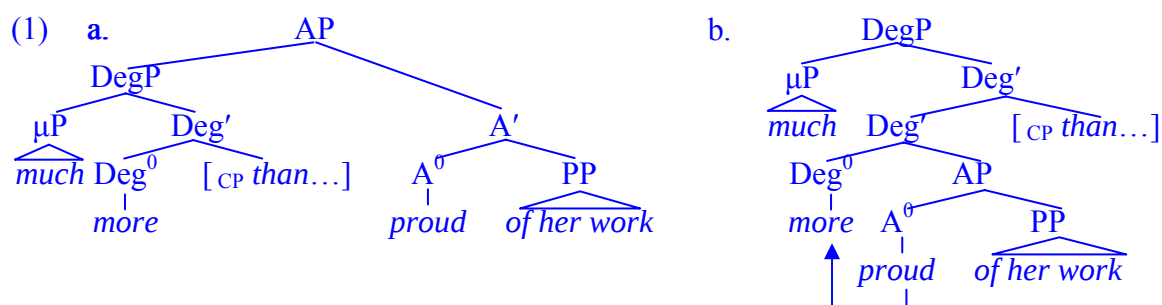
If the scope of a quantificational DP contains the trace of a degree operator, it also contains that degree operator itself.

However, degree operators do interact with **intensional predicates** (Heim (2000)); therefore, degree operators can scope. Intervention effects arise for quantification over variables of the type *e* and certain others, such as temporal adjuncts, but not for intensional verbs.

Further evidence for movement in comparatives comes from the interaction of the scope of comparatives with extraposition of the comparative clause (Williams (1974:194-195), Bhatt and Pancheva (2004)).

2. MORPHOSYNTAX

To permit the degree morpheme to move as high as it is supposed to, it is necessary to choose the structure in (1a) (advocated by Bowers (1975), Jackendoff (1977), etc.) over the structure in (1b) (proposed by Abney (1987), Bowers (1987) and Corver (1990, 1991, 1997a, 1997b)):



However, there exist several *a priori* reasons to exclude (1a).

2.1. Surface adjacency

The structure in (1a) does not fit the constituency observed on the surface, where the degree clause/phrase and the degree morpheme can be adjacent only incidentally:

NB: Bhatt and Pancheva (2004) offer a possible semantic reason for degree clauses to merge late and in a high position, but Grosu and Horvath (2006) show that it doesn't work.

- (20) a. a more intelligent person **than Einstein**
 b. *a more **than Einstein** intelligent person
 c. a smarter person **than Einstein**

2.2. Pronominalization

Milner (1978), Pinkham (1982): an overt pronoun may replace the AP in the degree phrase:

- (21) Il est aussi triste que I' était Jeanne hier.
 he is EQ sad CMPZR PRED.CL was Jeanne yesterday
He is as sad as Jeanne was yesterday.

A pronoun is generally taken to replace a maximal projection. While in (1a) such a maximal projection is not available, in (1b) the pronoun can be taken to replace the AP.

So-pronominalization in English seems to suggest the same conclusion:

(22) Alice is incredibly tall, and Beth is even more so.

It should be also noted that in order to deal with predicate pronominalization it is necessary to assume that the subject is merged either in [Spec, aP] or in the specifier of the functional head Pred⁰ (Bowers (1993, (2001))).

2.3. Superlative morpheme ordering

The superlative form contains the comparative one (Ultan (1972), Stateva (2002, 2003) and Bobaljik (2007)):

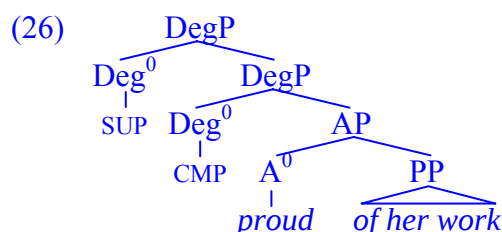
(23) a. olcsó-bb 'cheaper' Hungarian, Ultan (1972:140)
b. leg-olcsó-bb 'cheapest'

(24) a. Ivan je pametn-iji od Milene. Serbo-Croatian (Stateva (2003))
Ivan is smart-er than Milena
Ivan is smarter than Milena.
b. Ivan je naj-pametn-iji.
Ivan is most-smart-er
Ivan is the smartest.
c. *Ivan je naj-pametn.
Ivan is most-smart

(25) a. graž-iau 'more beautiful-NSG' Lithuanian, Bobaljik (2007)
b. graž-iau-sia 'most beautiful-NSG'

Semantically the superlative morpheme provides universal quantification over the standard of comparison (*more than all*).

The two morpheme orderings are only available with the following constituency:



If the comparative and the superlative morphemes had been in the same Spec, they couldn't have appeared on different sides of the root

If the two morphemes appear in the Specs of different functional heads, the constituency is the same as above, but additional questions arise (the nature of the functional projections, the argument structure on the comparative morpheme, etc.)

2.4. Summary

Morphosyntax rather favors the structure in (1b), where the AP is merged as the complement of Deg⁰, because this structure allows head-movement, which is necessary for morphological processes to take place.

However, the structure in (1b) is incompatible with QR:

- The head-movement constraint blocks QR
- The degree head and the comparison clause cannot move as a unit

Thus semantics and morphosyntax lead us to different conclusions.

3. LOCAL DISLOCATION

Potential solution: synthetic comparatives are not created by head movement

Embick and Noyer (2001), Embick (2007): the traditional head-movement approach cannot account for the prosodic constraint on synthetic comparative formation:

The prosodic constraint on the formation of synthetic comparatives and superlatives (cf. Quirk, et al. (1985)) -- only monosyllabic adjectives and disyllabic adjectives with a light second syllable (cf. *silly* – *sillier*, *yellow* – *yellower*) can give rise to synthetic forms -- is actually incorrect: quite a few disyllabic adjectives that allow synthetic comparatives do not have a light second syllable. The study of the Corpus of Contemporary American English (COCA) yields among others, *stupider* and *remoter*.

- (27) a. smarter, #more smart
b. *beautifuller, more beautiful

Since head movement happens before vocabulary insertion, no effect from the choice of the lexical root is expected.

Local Dislocation applies after Vocabulary Insertion and linearization, and affects both linear order and hierarchy:

- (28) a. $[_{XP} X [_{YP} [_{ZP} Z] Y]]$
b. $[X * [Z * Y]]$
c. $[[Z^0 Z+X] * Y]$

Note that, as with Affix Hopping, a new complex head Z^0 is created.

3.1. Effects of the adverb

Embick and Noyer (2001): if an adjective is modified by an adverb, synthetic comparative or superlative formation becomes impossible:

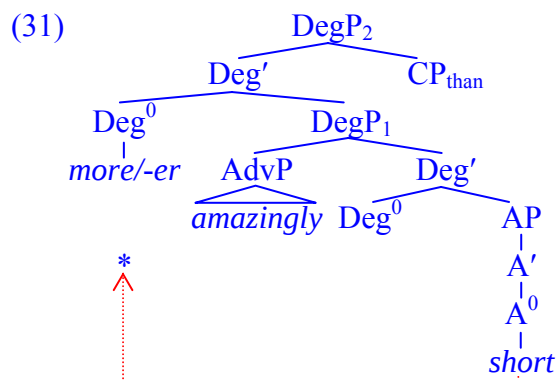
- (29) a. Mary is the most amazingly smart person.
b. *Mary is the amazingly smartest person.

My claim: this is **not a phonological** intervention effect; *amazingly* is a degree modifier (the degree to which Mary is smart is amazing).

- (30) a. Jude is smarter to an amazing degree than Joe.
b. Jude is smarter than Joe to an amazing degree.

The comparative morpheme does not seem to take scope over *smart to an amazing degree* in synthetic forms.

If there are two DegPs, an intervening functional head disrupts head movement:



Local Dislocation predicts sensitivity only to the intervening adverb; a PP is not intervening linearly.

A different choice of an adverb changes matters:

- (32) a. This building is more structurally weak than that one.
 b. This building is structurally weaker than that one.

Embick (2007): if head movement could have taken place, the synthetic comparative would have appeared to the left of the adverb:

- (33) a. This building is more structurally weak than that one.
 b. This building is structurally weaker than that one.
 c. *This building is weaker structurally than that one.

Dutch, where any adjective can form a synthetic comparative, also places the adverb before the comparative by default. This will become important later.

Hidden presupposition: an adverb is uniformly inserted below the degree operator.

- (34) a. A **probably better option** will be to create an artificial drug.
 b. *A more probably good option will be to create an artificial drug.

=> some adverbs must be inserted higher than DegP.

Also, with analytic comparatives and superlatives, where no movement is assumed to have taken place, both options are possible:

- (35) a. I became a **technically more proficient** guitarist.
 b. I became a **more technically proficient** guitarist.

Hypothesis: an adverb cannot combine with a scalar adjective directly.

We know it doesn't have to:

- (36) a. a technically oriented seminar
 b. a technically proficient guitarist
 c. a technically legal solution
 (37) a. a structurally deficient scheme
 b. top 10 structurally amazing bridges
 c. a structurally flawed approach

Assuming no type shifting:

- (38) a.
- b.

Be what may, relative positions of the degree operator and an adverb do not seem to be fixed.
 When an adverb and a scalar adjective combine, the result may not be scalar.

3.2. Synthetic blocking

Synthetic forms are not allowed in English for non-scalar adjectives and with metalinguistic comparatives:

- (39) a. My aunt is *Frencher/✓more French than Napoleon.
b. The guy is *taller/✓more tall than gaunt.

Important: languages differ in this respect:

Dutch is currently undergoing a linguistic change towards allowing analytic comparatives similarly to English.

- (40) a. Jan is Franser/ ?meer Frans dan Piet.
Jan is French+cmp more French than Piet
Jan is more French than Piet.
b. Jan is *dikker/ meer dik dan vet.
Jan is thick+cmp more thick than fat
Jan is more overweight than obese.

Metalinguistic comparatives are special.

Locality constraints on Local Dislocation should be the same cross-linguistically... and since, as mentioned above, Dutch also places the adverb before the comparative, by Embick and Noyer's reasoning it should also derive synthetic comparatives by Local Dislocation.

3.2.1. Semantic constraints on synthetic comparatives

Non-intersective adjectives don't permit either synthetic or analytic comparatives:

- (41) a. This is the *mainer/*^{/?}more main reason.
b. He is a *paster/*^{/?}more past king.

Non-scalar intersective monosyllabic adjectives, such as *French*, *right* or *male*, allow analytic comparatives only (in English; not in Dutch):

- (42) a. *My aunt is Frencher/deader/wronger than Napoleon.
b. My aunt is more French/more dead/more wrong than Napoleon.

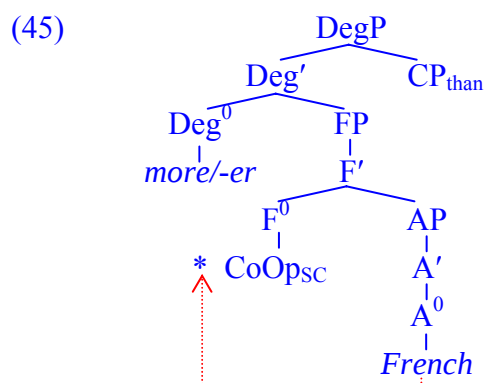
Non-intersective adjectives cannot be coerced.

Intersective non-scalar predicates can:

- (43) a. You're such a linguist. ≈ You're such a typical linguist.
b. You're such a fool. ≈ You're an utter fool.
(44) a. You're so tall. ≈ You're tall to such a high degree.
b. You're so French. ≈ You correspond so well to a stereotypical Frenchman.

As is easy to see, when a non-scalar predicate is combined with a degree operator or a degree adverb (such as *amazingly* or *very*), its meaning shifts from 'having the property X' towards 'having d-many properties stereotypically associated with having the property X', with the newly added degree argument associated with the number of the relevant properties.

I hypothesize that this meaning shift is accomplished by an additional functional head F^0 taking the relevant predicate as a complement and blocking head movement:



Intensional adjectives, such as *past*, or subsecutive adjectives, such as *main*, are of the wrong semantic type to combine with the coercion operator in (45).

Dutch differs from English in the fact that such additional functional heads do not block head movement.

It is unclear whether Local Dislocation should be affected by the presence of a null functional head, but no cross-linguistic variability is predicted.

3.2.2. Metalinguistic comparison

Bresnan (1973) notes that in certain environments synthetic comparatives are ungrammatical:

- (46) a. I am more angry than sad.
b. *I am angrier than sad.

The interpretation of (46) is metalinguistic or, in Bresnan's terms 'It's more true of me than I'm sad than that I'm angry'.

In exactly the same environment *much*-support is necessary with *as*:

- (47) a. I'm as much sad as angry.
b. *I'm as sad as angry.

Embick (2007) (following Bresnan (1973)) hypothesizes the presence of more structure:

- (48) John is lazy [more than stupid].

Under the same assumptions the locality conditions on head movement will not be met.

3.3. **Suppletion**

The combination of an adjective and a comparative morpheme can yield a suppletive form:

- (49) a. more + good → better English
b. plus + bon → meilleur French

Suppletion can only take place within a single head.

As Local Dislocation is a post-syntactic operation sensitive to individual lexical items, it can only apply after Vocabulary Insertion.

Before Local Dislocation there is no context for suppletion.

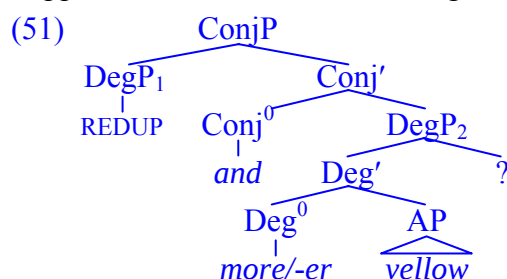
3.4. **Curiouser and curiouser**

Jackendoff (2000): (50) cannot be derived.

- (50) a. more and more beautiful
 b. prettier and prettier

The structure seems wrong for head movement (a coordination of heads should be impossible or it is unclear how a complement is merged), and Affix Hopping (or Local Dislocation) does not explain where the second copy of an adjective comes from.

Suppose it is a coordination of DegPs with reduplication:



The structure in (51) derives both (50a), where reduplication results in the repetition of the degree morpheme, and (50b), where reduplication is preceded by head-movement of the adjective into Deg⁰ yielding a complex head that serves as a source for the reduplicative morpheme.

Local Dislocation leads to incorrect results in this structure. Alternative structures based on (1a) make wrong predictions.

3.5. Summary

A post-syntactic operation such as Local Dislocation predicts lack of suppletion in synthetic comparatives and no cross-linguistic variability as to the environments where their formation is possible.

A narrow syntactic operation such as head movement should not be sensitive to individual lexical items (by current assumptions).

However...

- Like any movement, head movement should involve a copying operation.
- The comparative *-er* (unlike the equative *as*) is an affix.
- This property is usually assumed to be a syntactic feature visible in the narrow syntax.

An affix must be supported and thus A⁰-to-Deg⁰ movement is obligatory. As a result, after movement two copies of the A⁰ head are present: in the base position and adjoined to Deg⁰. In the course of Vocabulary Insertion (including suppletion), the resulting structure is evaluated and the lexical properties of various morphemes come into play. Thus *-er* imposes a prosodic constraint on the stem it attaches to: only “light” adjectives are allowed. Suppose that a “heavy” adjectival stem found in this position cannot be pronounced, which leads to the Last Resort operation of *much*-support. The need to spell out the phonological features of the adjective then forces the “heavy” stem to be pronounced in its base position, thus yielding an analytic form.

However, the problem is, I now become more and more concerned with the theoretical status of Last Resort operations...

The structure compatible with head movement is not compatible with Heim's compositional semantics.

4. I SAY “YES”, YOU SAY “NO”

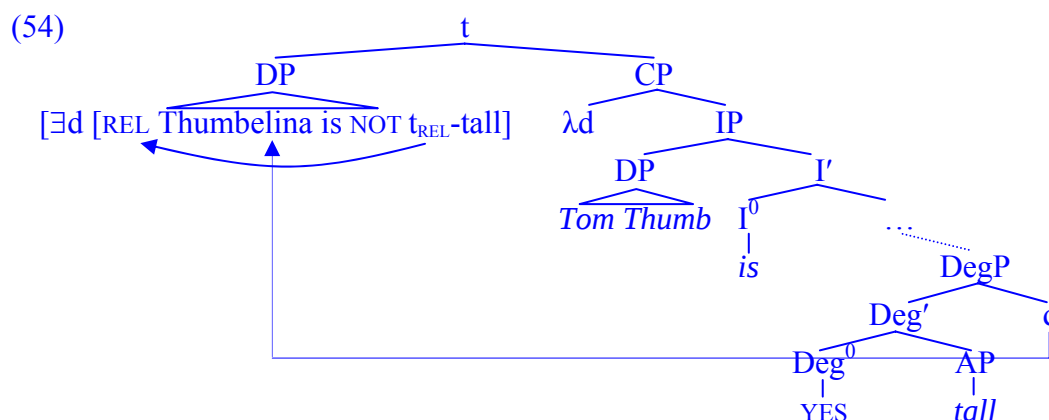
Ross (1969), McConnell-Ginet (1973), Seuren (1973), Klein (1980), Larson (1988), Stassen (1984): comparatives involve existential quantification combined with negation in the degree clause.

Matushansky (2010): the “degree morpheme” *-er* is a **positive verum marker**, similar to *bien* in French or *wel* in Dutch. Its counterpart in the degree clause is the **null negative verum marker**.

The comparative morpheme can in fact be optional:

- (52) a. tel aviv gdola mi- yafo. Hebrew
 Tel Aviv big-FSG from Jaffa
 b. tel aviv **yoter** gdola mi- yafo.
 Tel Aviv CMP big-FSG from Jaffa
Tel-Aviv is larger than Jaffa.
- (53) a. kinoo -yori kyoo -ga atui desu -yo. Japanese
 yesterday THAN today-NOM hot COP -ASRT
Today is hotter than yesterday.
 b. kinoo -mo atukatta kedo kyoo -wa **motto** atui desu -yo.
 yesterday -TOO hot-PAST but today-TOP CMP hot COP -ASRT
Yesterday was hot, but today is (even) hotter.

The degree clause is basically a relative clause:



Overt "negative"/scope marker in French degree clauses; overt negation in Italian, negation copying in cockney English:

- (55) a. Jean est plus grand que je **ne** pensais.
 Jean is more tall than I NEG thought
Jean is taller than I thought.
 b. Giovanni è più alto che **non** pensassi.
 Giovanni is more tall than NEG think-SBJ-1SG
Giovanni is taller than I thought.
- (56) a. He has never been no good to no woman, not never.
 b. She did a better job than what I never thought she would.

Stassen (1984, pp. 138-141): In many languages comparatives overtly involve what looks like sentential negation (though it remains unclear whether this morpheme actually has negative semantics):

- (57) kaw- ohra naha Waraka, kaw naha Kaywerye. Hixkaryana, Stassen (1984, p.35)
 tall not he.is Waraka tall he.is Kaywerye
Kaywerye is taller than Waraka.

Joly (1967): The English *than* is historically derived from a neuter (singular) relative pronoun in the instrumental case (*bon*) and a negation element (*ne*).

Caution: **This simple story is not enough.** The position of negation cannot uniformly be low and something like a maximality operator is required in the comparison clause. But this is another story (Matushansky (2010))

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