

Notes on superlatives¹

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A sentence like (1) can be understood in two ways².

(1) John climbed the highest mountain.

(1) may mean that John climbed the highest of all mountains. Given that the highest mountain in our world is Mount Everest, (1) understood in this way will be true iff John climbed Mount Everest. Following Szabolcsi, I call this the "absolute reading".

But (1) need not be used to make quite so spectacular a claim. It can also mean that John climbed a higher mountain than anyone else (or anyone else in the contextually salient domain). In this usage, which Szabolcsi calls a "comparative reading," (1) may be true on the grounds of John's climbing some puny hill like Mount Holyoke, provided that nobody else (relevant) climbed anything higher.

Another illustration of the same putative ambiguity is the question in (2), to which one can respond as in (a) if one reads it in the absolute sense, or as in (b) if one perceives the comparative reading.

(2) Who wrote the largest prime number on the blackboard?

(a) Nobody, of course. There is no largest prime number!

(b) John did. His was the only one above 100.

By calling these two "readings" of an "ambiguous" sentence, I don't mean to prejudge the main issue I want to debate in the following pages, namely whether this is really a genuine ambiguity or rather just a case of context-dependency. The former view has prevailed in the recent literature: Heim, (1985) and Szabolcsi (1986)³ in particular proposed that we are dealing with a straightforward scope ambiguity here, a structural ambiguity at the level of LF. However, these authors did not give very serious consideration to an alternative view that comes to mind quite readily: Perhaps the two "readings" share a single LF which contains a covert deictic element, and it is alternative resolutions of the latter's reference that give rise to the apparent ambiguity.

In the first part of these notes, I will give concrete formulations of the two theories. Then I will

¹ This draft was written in 1995, except for some footnotes added in 1999.

²This observation apparently goes back to J. R. Ross (1964) "A partial grammar of English superlatives," UPenn MA thesis. Further early references include J. Bowers (1969) "Surface structure interpretation in English superlatives," unpubl. MIT ms.; C.L. Baker (1970), anonymous review of Bowers; and R. Jackendoff (1972) Semantic Interpretation in Generative Grammar, MIT Press (p. 254). It was rediscovered in Szabolcsi (1986) and Heim (1985) "Notes on comparatives and related matters," unpubl. UTexas ms.

³See also M. Gawron (1992) "Focus and ellipsis in comparatives and superlatives: a case study," in C. Barker & D. Dowty (eds.) SALT 2, and Gawron (1995) "Comparatives, superlatives, and resolution," L&P 18.4, pp. 333 - 380 – though the classification of Gawron's analysis as a scope-theory may suffer from the indeterminacy of cross-framework translation.

show that each has some points in its favor as well as some significant weaknesses. On balance, the scope theory wins.

1. Background assumptions on adjective gradation

A superlative form like *tallest* is made up of two morphemes, the adjective stem *tall* and superlative suffix *-est*. In a compositional semantics, the meaning of *tallest* should thus be determined from the meanings of *tall* and *-est*, by some standard mode of semantic composition. Following Cresswell (1976) and others, I begin by assuming that an (intransitive) adjective stem expresses a relation between an object and a degree. For example:

$$(3) \quad \text{tall}(x, d) \iff x \text{ is tall to degree } d$$

'tall to degree d ' will henceforth be abbreviated as ' d -tall.' Regarding the meaning of *-est*, the basic intuition to be captured is that a superlative predicate is paraphrasable in terms of a comparative with a universally quantified 'than'-phrase. For instance, *tallest* means 'taller than everything else.' For simplicity, I adopt Seuren's semantics for comparatives, in which ' x is taller than y ' means that x is tall to some degree to which y is not.⁴ For this paraphrase to make the intended sense, we must assume the meanings of the unaffixed adjectives to be downward monotonic⁵:

$$(4) \quad \text{A relation } R \text{ between objects and degrees is } \underline{\text{downward monotonic}} \text{ iff} \\ \iff \forall x, d, d' [R(x, d) \ \& \ d > d' \implies R(x, d')].$$

For instance, if John is exactly 5'5" tall, then he is also 5'4" tall, 5'3" tall, etc., but not 5'6" or 5'7" tall. It follows that, if Bill is tall to a degree to which John isn't, this must be a degree above 5'5" rather than below it, and so Bill must be taller than John.

Putting Seuren's comparative semantics together with the observation that *tallest* means 'taller than everything else,' we arrive at the meaning for *tallest* in (5).

$$(5) \quad \text{tallest}(x) \iff \exists d (\text{tall}(x, d) \ \& \ \forall y [y \neq x \implies \neg \text{tall}(y, d)])$$

From this we can factor out the first version of our lexical entry for the superlative affix *-est*.

$$(6) \quad \text{Let } x \text{ be an individual, } R \text{ an adjective-meaning (= a relation between objects and} \\ \text{degrees). Then} \\ \text{-est}(x, R) \iff \exists d (R(x, d) \ \& \ \forall y [y \neq x \implies \neg R(y, d)])$$

On this analysis, *-est* takes two arguments, which I will refer to as its internal argument, syntactically realized by the adjective it affixes to, and its external argument, which is realized (if at all) by the subject of which the whole adjective+affix complex is predicated.

How does a superlative predicate like *tallest* contribute to the meanings of the larger phrases and sentences that contain it? The case of a predicative occurrence in a copula sentence such as *John is tallest* requires no further comment here. Prenominal-modifier occurrences, as we see them in (1) and (2), are less straightforward. The treatment which I am about to sketch is probably not

⁴See Seuren (1973). For critical discussion and better motivated alternatives, see Stechow (1984a,b), Pinkal (1990). Nothing hinges on the choice for my present purposes.

⁵I found this use of the term "downward monotonic" in Gawron (1995).

right, but hopefully it can be refined or replaced without undermining the reasoning in the following sections.

Suppose in a combination like *tall man*, the adjective takes the noun as an argument. as in (7).⁶

- (7) Let P be a 1-place property, x an object, and d a degree. Then
 $tall(P)(d)(x) \iff x \text{ has } P \text{ and } x \text{ is } d\text{-tall.}$

This implies that the LF-constituency of *tallest man* is *-est [tall man]* (rather than *[-est tall man]*),⁷ because only after applying *tall* to *man* do we have a meaning of the type selected by *-est*. The predicted meaning for *tallest man*, given the entry for *-est* in (7), is this:

- (8) $tallest\ man(x) \iff \exists d (x \text{ is a } d\text{-tall man} \ \& \ \forall y [y \neq x \implies \neg y \text{ is a } d\text{-tall man}])$

This is the proper meaning for the predicate *tallest man*: If everything distinct from x fails to be a d-tall man, then every man distinct from x fails to be d-tall (i.e., has a height of less than d), but nothing follows about the heights of non-men.

2. Context-dependency analysis of absolute/comparative ambiguities

It is a truism that quantifiers in natural discourse are subject to implicit restrictions on their domain. For instance, *Everyone had a good time* need not be understood as a universal claim about all of humankind, but may be used to assert that everyone who was present at a certain contextually salient party had a good time. It will hardly surprise us therefore if a superlative adjective like *tallest* turns out to exhibit the same context-dependency as its explicit universal-quantifier paraphrase *taller than everything else*. Consider the following text.

- (9) All of these candidates are acceptable. But John is most impressive.

most impressive here is readily understood to mean 'more impressive than any other one of these candidates,' not 'more impressive than anyone else in the world.' Following v. Fintel (1994), we may localize the context-dependency of quantifiers like *every* in an extra argument, a phonetically unrealized predicate variable that appears next to the determiner at LF and receives a value from the context of utterance. Adapted to the case at hand, this suggests that *-est* likewise takes an additional argument, as in the amended lexical entry below.

- (10) $-est(x, R, C) \iff \exists d (R(x,d) \ \& \ \forall y [y \neq x \ \& \ y \in C \implies \neg R(y,d)])$

So we have a "domain argument" in addition to the internal and external arguments in (7) above, and this is realized by a predicate variable, written to the left of *-est* in the LFs below. In the salient reading of the second sentence in (9), an LF like (11a) is interpreted in a context that supplies the assignment specified in (11b).

- (11) (a) John is [C -est] impressive
 (b) $C = \{x: x \text{ is one of these candidates}\}$

⁶We can think of the meanings in (5) and (7) as related by a type-shifting rule (see exercise in ch. 4 of Heim & Kratzer). Or (7) could be the basic meaning, and (5) the result of applying it to an empty noun meaning 'individual'.

⁷Perhaps the appropriate constituency is even present already at S-structure, as suggested by Berman (1973) and Abney (1987). Otherwise, it must be obtained by LF-movement of *-est*.

It is plausible that this value for C is a salient choice when these candidates have just been mentioned in the previous sentence.⁸

Once we have drawn attention to the inherent context-dependency of superlatives, it is a matter of common sense to view the so-called ambiguity in sentences like (1) as just another manifestation thereof. Suppose the LF of (1) looks like this:

(12) John climbed [the [[C -est] [high mountain]]]

Using ordinary meanings for *John*, *climbed*, and *the*, (12) means that John climbed the unique object which falls under the predicate [C -est] [high mountain]. Given that [high mountain] is the relation which x bears to d iff x is a d -high mountain, and given our present entry for -est, this in turn means that John climbed the unique x such that x is a higher mountain than any other element of C . C may be presuppositionally constrained to be some set of mountains⁹, but which such set it is may vary from one utterance of (12) to the next.

Suppose C happens to be the set of all mountains on earth. Then we get, in effect, what we initially described as the "absolute reading", and (12) is true only if John climbed Mount Everest. Suppose, on the other hand, C happens to be the set of all mountains that were climbed by some member of the Smith family. In that event, (12) amounts to the assertion that John climbed the highest mountain climbed by a Smith, which could be Mount Holyoke. This seems to be an instance of our "comparative reading".

An analysis along these lines appeals to common sense. It invokes a minimum of syntactic and semantic machinery, all of which is motivated independently of our particular "ambiguity". In the next section, we will see that it also supports an attractive account of the interaction between superlatives and focus.

3. The disambiguating effect of focus

Sentences with more constituents than (1) tend to have more than one comparative reading. Consider example (13).

(13) John put the tallest plant on the table.

Apart from its absolute reading, (13) could be used to mean that John put a taller plant on the table than anyone else did, or else that John put a taller plant on the table than he put anywhere

⁸Salience and overall plausibility bear the main burden of fixing the domain argument of a given utterance of -est, but there seem to be some limits imposed by the semantics of the construction itself. Even though you didn't know who John was, when you read (9), you spontaneously inferred that he was one of these candidates. I suggest this is due to a general constraint on the choice of C , namely that x (the external argument) must be one of its elements. Another constraint I will assume is that C must be a subset of the left domain of R (the internal argument). (In the present case, this just means that everything in C must have some degree of impressiveness.) We can think of these mutual constraints on the values of -est's three arguments as presuppositions and incorporate them into the lexical entry:

(i) '-est (x , R , C)' has no truth value unless $x \in C$ & $\forall y [y \in C \supset \exists d R(y,d)]$;
when it has a truth value, it is true iff $\exists d (R(x,d) \& \forall y [y \neq x \& y \in C \supset \neg R(y,d)])$

⁹See note 7.

else. Both are comparative readings, but in the first one, John is compared to other people, whereas in the second one, the table is compared to other places.

A long-standing observation in this connection is that each reading is favored by a different way of pronouncing the sentence.¹⁰ If we put focus on *John*, as in (13a), we facilitate the meaning that John put a taller plant on the table than anyone else did.

(13a) John_F put the tallest plant on the table.

(13b), on the other hand, with focus on *on the table*, favors the meaning that John put a taller plant on the table than he put anywhere else.

(13b) John put the tallest plant on the table_F.

The item that is being compared tends to get the focus.

Under the present analysis, the two readings under consideration have to result from two different settings for the value of the context variable C in the LF of (13). If C is the set of plants put by someone on the table, we obtain the comparative reading comparing John. If C is the set of plants put by John somewhere, this gives rise to the comparative reading comparing the table. How does the placement of focus contribute to the setting of these values?

The contrast between (13a) and (13b) is reminiscent of the familiar one in (14), from Rooth (1985).

(14a) Mary always takes John_F to the movies.

(b) Mary_F always takes John to the movies.

(14a) tends to mean that, whenever Mary takes someone to the movies, she takes John to the movies, whereas (14b) is naturally read as saying that, whenever someone takes John to the movies, Mary takes him to the movies. The descriptive generalization here is that the understood restriction for the quantifier *always* can be obtained by substituting an existential quantifier for the focussed item: When *John* is focussed, *always* ranges over the times at which Mary takes someone to the movies, and when *Mary* is focussed, it ranges over the times at which someone takes John to the movies. The case of our superlative sentences (13a) and (13b) is entirely analogous: *-est* contains a covert universal quantifier over plants. Like the adverbial quantifier *always* in (14a,b), this quantifier does not have an overt restrictor, but it is understood as restricted. The implicit restriction can again be predicted by substituting an existential quantifier for the focus: Where the focus is on *John*, we quantify over plants that someone put on the table, and where the focus is on *on the table*, over plants that John put somewhere.

This was just a sketch of the analogy, but once we have perceived it on this informal level, an explicit analysis of the focus-effect in superlatives is easy to construct. We can simply model it on an existing analysis of focus-effects with adverbs of quantification. Let's take v. Fintel's (1994) adaptation of Rooth (1985) in the framework of Rooth (1992). Von Fintel's LF-representation for (14a) is roughly (15).

(15) $\llbracket C \text{ always} \rrbracket \llbracket t[\text{Mary (at) } t \text{ takes John}_F \text{ to the movies}] \sim C \rrbracket$

¹⁰This observation also seems to go back to Ross, and was further discussed, analyzed, or rediscovered in the papers cited in notes 1 and 2.

C here is a free variable over sets of sets of times¹¹, whose value must be supplied by the context. The focus-interpretation operator \sim introduces the presupposition that the value of C is a subset of the focus-value of $\llbracket t[\text{Mary at } t \text{ takes John}_F \text{ to the movies}] \rrbracket$. By the general compositional rules for focus-values, this is the set $\{P: \llbracket x[P = \llbracket t[\text{Mary at } t \text{ takes } x \text{ to the movies}]] \rrbracket\}$. Given that the value of C is a subset of $\{P: \llbracket x[P = \llbracket t[\text{Mary at } t \text{ takes } x \text{ to the movies}]] \rrbracket\}$, its union is a subset of $\llbracket \{P: \llbracket x[P = \llbracket t[\text{Mary at } t \text{ takes } x \text{ to the movies}]] \rrbracket\} \rrbracket$, which equals $\llbracket t \llbracket x[\text{Mary at } t \text{ takes } x \text{ to the movies}] \rrbracket$. So $\llbracket C$, the restriction of *always*, must denote a set of times at which Mary takes somebody to the movies. The analogous prediction for the alternative choice of focus in (14b) is derived in the same way.

We can give a fully parallel derivation of the focus effect in the superlative examples, if we make a couple of apparently harmless changes in our assumptions about their LFs. First, we must assume that the definite DP containing the superlative is QRed; this is necessary in order to provide us with a constituent to which to attach the \sim -operator. Second, we have to assume that the context doesn't directly supply a set of objects, but rather a set of sets of objects, whose union then is the restriction for *-est*. So the LF for (13b) looks as in (16).

(16) $\llbracket \text{the } \llbracket C \text{-est} \rrbracket \llbracket \text{tall plant} \rrbracket \rrbracket \llbracket \llbracket x[\text{John}_F \text{ put } x \text{ on the table}] \rrbracket \sim C \rrbracket$

The presupposition supplied by the focus-interpretation operator here implies that $\llbracket C \llbracket \llbracket x \llbracket y[\text{put } x \text{ on the table}] \rrbracket \rrbracket \rrbracket$. The set of plants put by somebody on the table satisfies this constraint, but, for instance, the set of plants put by John somewhere doesn't. So the disambiguating effect of focus is correctly predicted.

It is worth pointing out that this analysis does not predict that a focus on *John* is necessary to obtain the reading in question. As long as contextual clues are sufficient to make the set of plants put by somebody on the table the most salient choice for the domain argument of *-est*, this can happen without any help from focus on *John*. We even predict that a focus on some other constituent can be compatible with this reading, as long as this focus is interpreted by an instance of $\sim C$ not coindexed with the domain-argument of *-est*. These predictions seem to be appropriate. Consider the following dialogue, with main prosodic stress in the answer on *plant*:

(17) How does one win this contest?
- By putting the tallest plánt on the table.

This answer can easily mean 'by putting a taller plant on the table than any other contestant does'. We obtain this reading by setting the domain-argument of *-est* to the set of plants that some contestant puts on the table. Apparently, this does not require any focus on the subject of *put*. In the example at hand, this subject is not even phonetically realized, much less prosodically prominent in any way that could realize focus.¹² (The only focus in this sentence is presumably

¹¹Actually, v. Fintel assumes quantification over situations rather than times, but this is not important for the present illustration.

¹²I am thus disagreeing with Szabolcsi (1986), who explicitly claims that the subject must be either focussed or wh-moved in order to obtain a comparative reading in which it denotes the compared item. I am not completely sure, however, whether this is a disagreement about judgments. Szabolcsi's claim is consistent with my judgment regarding (17) if she does not assume that focus must be prosodically realized. I assume that it must be. This is a complex and

on the entire VP, and it is interpreted at the utterance level to express question-answer coherence.)

4. A problem with comparative readings in intensional contexts

Consider (18).

(18) John wants to climb the highest mountain.

Many of the possible readings for this sentence are unproblematic for our current analysis. For instance, (18) could mean that John wants it to be the case that he climbs a higher mountain than anyone else. We may call this a "comparative, de dicto" reading: the DP *the highest mountain* is interpreted within the scope of *want* (hence "de dicto"), and the complement sentence of *want* (viz., *PRO to climb the highest mountain*) receives exactly the reading that we initially introduced as the "comparative" reading of (1).¹³ Another possibility is that (18) means the following: the mountain which is higher than any other mountain is such that John wants to climb it. This could be labelled an "absolute, de re" reading. "Comparative, de re" and "absolute, de dicto" readings can also be identified, once one looks for them and imagines appropriate contexts. I leave it to the reader to spell out what these would amount to. All of these are straightforwardly predicted if we assume the usual scope options for the DP *the highest mountain* (above or below *want*), plus different choices for the implicit domain of the universal quantifier in *-est*.

However, there is one reading in (18) that I claim cannot be generated on our current assumptions. It may not be the most salient reading, but it is quite available in an appropriate

controversial issue, however, and I cannot justify my choice here. For some recent contributions which I have been especially influenced by, see Rooth (1995), Truckenbrodt (1995), and Kowalski (1992).

Examples like (17) were first brought to my attention by C.L. Baker (personal communication 1985), who noted them as counterexamples to a claim apparently similar to Szabolcsi's in Bowers (1969).

¹³The LF for this reading could look as in (i) (under the simpler analysis that we used before we took focus into account), or as in (i') (if we implement the amendments from section 3).

- (i) $\Box_{w_0} \left[\text{John wants}_{w_0} \left[\Box_{w_1} \left[\text{PRO to climb}_{w_1} \left[\text{the } [f(w_1) \text{-est}] \left[\text{high}_{w_1} \text{ mountain}_{w_1} \right] \right] \right] \right] \right]$
- (i') $\Box_{w_0} \left[\text{John wants}_{w_0} \left[\Box_{w_1} \left[\left[\text{the } \left[\Box [f(w_1) \text{-est}] \left[\text{high}_{w_1} \text{ mountain}_{w_1} \right] \right] \right] \left[\Box x \left[\text{PRO to climb}_{w_1} x \right] \sim f(w_1) \right] \right] \right] \right]$

Notice that the domain-argument of *-est* here is represented as a function of the evaluation world. This is necessary to capture the fact that the set of mountains climbed by somebody may vary from one desire-world to the next. Concretely, in order to obtain the comparative de dicto reading described in the text, the value of *f* in (i) should be that function which maps each world *w* to the set $\{y: \text{mountain}_w(y) \ \& \ \Box x [\text{person}_w(x) \ \& \ \text{climb}_w(y,x)]\}$. (In (i'), it would be the function which maps each world *w* to the set of sets $\{P: \Box x [\text{person}_w(x) \ \& \ P = \{y: \text{mountain}_w(y) \ \& \ \text{climb}_w(y,x)\}]\}$.)

context. To help it along, consider first the question (19).

(19) How high a mountain do you want to climb?

This question clearly has a reading under which it calls for de dicto answers, i.e., answers which do not express an attitude towards some particular mountain. I might answer (19) by saying: "I want to climb a mountain that is 4,000 m high," and mean by this that in every one of my wish-worlds I climb some 4,000 m high mountain, though not the same one in all of them. Now suppose I use question (19) on this reading to conduct a survey about people's athletic ambitions. I get the following answers. Mary says: "I want to climb a mountain that is 4,000 m high," John says: "I want to climb a mountain that is 6,000 m high," and Bill says: "I just want to climb a mountain that is 1,000 m high." All of these respondents understood my question correctly and meant their answers in the de dicto sense. (Suppose, if you will, that none of them even knew what mountains of each height are out there.) Now I summarize the results of my survey by uttering sentence (18): "My survey shows that John is the most ambitious. Of all the people I have asked, he (John) wants to climb the highest mountain."

This reading of (18), I claim, is problematic. To see why, let's try to find a suitable LF to express it. Since it doesn't imply that there is any particular mountain that John wants to climb, we cannot scope *the highest mountain* over *want*. So the scope relations have to be as in (20)¹⁴.

(20) John wants \Box_w [PRO to climb_w [the $\left\{ \begin{array}{l} C \\ f(w) \end{array} \right\}$ -est [high_w mountain_w]]]

What exactly (20) says depends on the value of the superlative's domain argument. I am representing this as either C or $f(w)$ to provide for the possibility that it may vary with the desire-worlds. The question now is if we can find any value for C or f so that (20) expresses the reading we are after.

It is clear that $f(w)$ cannot, for instance, be the set of all mountains in w , or the set of all mountains that Mary, Bill, or John climb in w . These choices would give rise to readings according to which John has a desire with a "comparative content," so to speak, i.e., readings that portray him as caring about the relative height of the mountain he climbs with respect to certain other mountains. There are, of course, such readings in (18), but the one we are after is not like that. In the survey-scenario I sketched, (18) may well be true if John doesn't care whether there even are any mountains of less than 6,000m, or if he wants everyone other than himself to climb higher ones.

What about letting C denote the set of all possible mountains that Mary, John or Bill climb in one of their desire-worlds? This doesn't seem to work either. For one thing, (20) would then imply that John climbs the same mountain in each of his desire-worlds. We might circumvent this prediction by assuming that the definite article in the environment of a superlative need not have its standard interpretation, but may occur as a purely vacuous item in the surface realization

¹⁴*the highest mountain* might be QRed within the *want*-complement, but this wouldn't make a difference for the reasoning below. I am also ignoring the other amendments that I sketched in section 3 to deal with focus. They don't affect the argument.

of a semantically indefinite DP.¹⁵ But even then, this choice of domain-argument wouldn't be quite right, for the following reason: Given what e.g. Mary told me in the survey, she doesn't necessarily have anything against climbing a 8,000 m mountain (perhaps in addition to a 4,000 m one). So the set of mountains climbed by one of Mary, John and Bill in one of their desire-worlds could contain an 8,000 m mountain. Consequently, the truth of (18) should require that John climbs some mountain higher than that in each of his want-worlds -- which intuitively it doesn't.

Here is my best shot at an appropriate choice of value for $f(w)$ in (20): First, define for each person x the set of degrees $S_x := \{d: x \text{ wants to climb a } d\text{-high mountain}\}$. (A more explicit definition of this set is $S_x := \{d: \text{for every world } w \text{ which conforms to what } x \text{ wants, } x \text{ climbs some } d\text{-high mountain in } w\}$.) Now let $f(w)$ be the set $\{y: \exists x \in \{\text{Mary, John, Bill}\} \exists d \in S_x: y \text{ is a } d\text{-high mountain in } w\}$. Notice that this way of constructing $f(w)$ guarantees that the 8,000m-high mountains that Mary climbs in some of her desire-worlds will not make it into the domain (because she doesn't climb 8,000m high mountains in all her desire-worlds¹⁶). So the objection against the previous attempt does not carry over. We still have a problem with uniqueness, though, even if we read the definite article as indefinite. Our lexical entry for *-est* requires that the domain contain a unique maximal element, i.e., that there be some mountain in $f(w)$ that is higher than all others, and this will typically not be the case. For instance, if the facts regarding people's attitudes are as described by their answers in our survey-scenario, then $f(w)$ will be the set of all mountains in w that are up to 6,000 m high. Presumably, some of the worlds conforming to John's desires contain more than one 6,000m mountain, and for such choices of w , the predicate $f(w)$ *-est [high mountain]* has an empty extension. Perhaps we can overcome this remaining hurdle by factoring out the contribution of singular number from our current entry for *-est*,¹⁷ and by allowing ourselves to disregard singularity along with definiteness as semantically vacuous in the example at hand. But I will stop here with the conclusion that we have run into a *prima facie* problem for the analysis under discussion: as far as I can see at this point, (18) has a reading which this analysis cannot account for.

5. "Misplaced" external arguments as evidence for *-est*-movement

So far we have applied the superlative affix only to intransitive adjectives, i.e., those which have only one argument besides their degree-argument. What about transitive adjectives like *proud*

¹⁵This view has been defended in the syntactic literature, notably by Selkirk (1977), pp. 297 - 298 (who suggests that *the* is inserted at surface structure into the position vacated by affix-movement of *-est* onto the adjective.) We will get back to it below in connection with the "movement analysis" of comparative superlatives.

¹⁶If she did, it would be true (on the relevant reading) that Mary wants to climb a mountain 8,000m high, and therefore it would be false that it is John who wants to climb the highest mountain.

¹⁷Notice that plural superlative descriptions such as *the highest mountains* are clearly appropriate without there being a unique mountain that is higher than all others (in the relevant domain). So it is independently plausible that part of what I have written into the entry for *-est* is not really part of the meaning of the superlative, but rather should be made to result from the combination of superlative and singular.

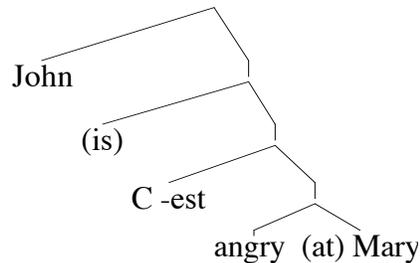
(of) or *angry (at)*? At first, these seem easy to accommodate. Suppose their additional argument is the most internal one¹⁸:

(21) $[[angry]](x)(d)(y) = 1$ iff y is angry to degree d at x .

So a phrase like *angriest at Mary* is built up by first combining *angry* and *(at) Mary*, at which point we have a phrase of the same semantic type as an intransitive adjective stem, ready to combine with *-est*:¹⁹

(22) John is angriest at Mary.

(23) LF:



(23) means that John is angrier at Mary than any other member of C is, and it thus provides a fine analysis of one reading of the sentence in (22). But there is another meaning that (22) can express, namely that John is angrier at Mary than he is at anyone else (in C). How shall we generate that one?

It is not hard to determine how the meaningful morphemes contained in (22) would have to be arranged in order to construct the meaning under consideration:

(24) $Mary [C -est] \lambda d \lambda x [John d\text{-}angry (at) x]$

In (24), an open sentence is formed by applying *angry* to variables for its innermost and degree arguments and to *John*. Then a 2-place relation between objects and degrees is obtained from this by λ -abstracting over the two variables. This relation holds between x and d iff John is d -angry at x . It is of the right type to combine with *C -est*, and the meaning of the whole formula is the one we want.

The problem is: how can we obtain anything like (24) from the syntactic structure of (22)? It seems that we'd have to move things around quite a bit. If we assume that movement leaves a trace interpreted as a variable and creates a λ -abstract in which that variable is bound, we can construct the following LF-derivation.²⁰

¹⁸This is the meaning appropriate for predicate occurrences, which may or may not be derived by type-shift or adding a zero noun from the meaning for pronominal occurrences. This doesn't matter here.

¹⁹Parenthesized items in the LF are those that I treat as semantically vacuous.

²⁰The derivation in (25) presupposes that QR creates λ -abstracts as genuine syntactic constituents, as argued for by Nissenbaum (1997). It would not do here to adopt the more conventional view, on which QR-structures divide syntactically into an indexed moved phrase and an open sentence (and λ -abstraction takes place only when they are translated or interpreted). This would not allow for derivations like (25), in which QR feeds a movement which targets the λ -abstract as an adjunction site.

- (25) SS: John is [[C -est] angry at Mary]
 □ (by QR of *Mary*)
 Mary □x[John is [C -est] angry at x]
 □ (by raising *-est*)
 Mary [C -est] □d □x[John is d angry at x]

In all examples considered in the previous sections, we were able to interpret the superlative morpheme pretty much in its surface position. I say "pretty much," because in the case of prenominal adjectives it had to be a little higher than in immediate sisterhood with the adjective it affixes to. But only a little bit. But for this second reading of (22), we are apparently forced to move it, and far enough to land above the subject. Before we accept this conclusion, let's see what it would cost us to avoid it.

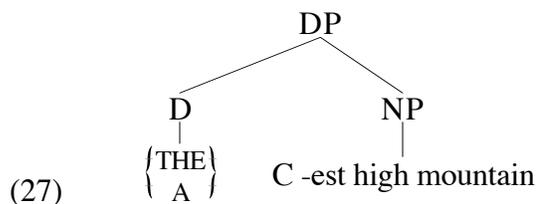
We can make the movements needed much more local, though not eliminate them altogether, if we acknowledge an AP-internal subject position. Suppose there is a trace of *John* in the AP, so we start from an SS like (26).

- (26) John₁ is [_{AP} t₁ [C -est] angry at Mary]

It will then suffice to QR *Mary* to the edge of AP, and move *C -est* right below it, to generate an LF which is equivalent (by □-conversion of *John*) with the one in (25). Still, some movement is needed, as a structure like (23), interpreted as is, only represents the other reading of (22).

6. Movement analysis

Szabolcsi (1986) argued that DPs like *the highest mountain* are ambiguous between a definite and an indefinite construal. Let us implement this idea by assuming that the *the* which appears on the surface is semantically vacuous, whereas the determiner that is actually interpreted is a superficially unrealized instance of either the definite or the indefinite article.²¹



Furthermore, Szabolcsi (1986) as well as Heim (1985) proposed that *-est* can undergo LF-movement out of its host DP. This movement leaves behind a degree-variable in the adjective's argument structure, and it is subject to certain syntactic island constraints.

²¹This syntactic analysis of the DP is different from Szabolcsi's actual proposal. According to Szabolcsi, the surface-article is part of a discontinuous item *the -est*, and whether the whole DP is definite or indefinite correlates with whether this item is attached at the N'''-level or the N"-level. But the structures are not fully spelled out and their compositional interpretation is left open. I have added the contrasting covert determiners because I am presupposing a framework of compositional interpretation in which differences in attachment height by themselves cannot produce differences in meaning. It is perfectly possible, of course, that the structural differences hypothesized by Szabolcsi are present as well. I don't mean to deny these here, just to abstract away from them.

What LF-representations do these two new assumptions allow us to generate? First, it is clear that the same LFs that we have posited so far are all still available: we can always choose *THE* as the determiner and refrain from moving *C -est* beyond NP. For our initial sentence (1), for instance, we still generate LF (12), with the same (context-dependent) meaning as before.

- (1) John climbed the highest mountain.
 (12) John climbed [THE [C -est] □d[d-high mountain]]

But the options of choosing an indefinite determiner and of moving *C -est* out of the DP add further, genuinely new, possibilities. Following Szabolcsi, I assume here that these two choices are not independent of each other: Since definite DPs are generally islands for extraction²², movement of *C -est* across D is only allowed when D is occupied by the indefinite article *A*.²³ In that case, what are the possible landing-sites for *C -est*?²⁴

Given the semantic type of *C -est* (see lexical entry (10)), it will only be interpretable in an LF where it has a sister-node expressing a relation between individuals and degrees. This means we must choose an adjunction site that is a 1-place predicate of individuals. Then the movement of *C -est* will add to this a □-abstractor over degrees, creating the required 2-place relation. In an example like (1), this implies that if *C -est* leaves the DP, it can only land in a position between *John* and the VP:

- (28) John [C -est] □d[climbed [A d-high mountain]]

□d[*climbed [A d-high mountain]*] denotes the relation that *x* bears to *d* iff *x* climbs a *d*-high mountain, and when we apply the meaning of *C -est* to this, we get the property of climbing a higher mountain than any other element of *C*. (28) ascribes this property to John; in other words, this LF turns out to be a representation of what we have been calling the comparative reading of (1).

In more complex sentences, the 1-place predicate that is chosen as the adjunction site in *C -est*-movement need not always be a surface constituent (such as a VP). It can also be a predicate created only in the course of LF-derivation, e.g. by an application of QR. For instance, we can derive an interpretable LF for our sentence (13) by first QRing *on the table* and then raising *C -*

²²Why exactly this is the case may be left open here.

²³Szabolcsi makes the stronger assumption that *-est* remains inside DP if and only if D is *THE*, though she does not address the question of why *A* should not be freely available regardless of whether *-est* moves. An explanation for this might be that there is a general prohibition against using an indefinite when the presuppositions of the corresponding definite are known to be fulfilled; see Heim (1991), Hawkins (1991), and Matthewson (handout for seminar at UMass, 1999). It is not clear, however, how a pragmatic account of this sort can handle the contrast between **John is a tallest man* and *John is a man taller than any other man*.

²⁴Szabolcsi assumes that whenever *-est* moves out of its host AP, it is adjoined to INFL. I won't make this assumption here, since it is not clear to me what morphological, syntactic or semantic properties would predict this to be the only possible landing site in general. I assume that interpretability imposes certain limits on where *-est* can wind up. Within these limits, the choices are presumably further constrained by genuinely syntactic principles, but I will not commit myself to any details. Some of my LFs below are clearly compatible with *-est* occupying INFL (e.g., (28)), but others (e.g., (29)) don't seem to be.

est to a position between this moved phrase and the \bar{c} -abstract created by its movement.

(29) SS for (13):

John put [A [C -est] tall plant] on the table

by QR of *on the table*:

on the table \bar{c} [John put [A [C -est] tall plant] x]

by movement of *-est*:

on the table [C -est] \bar{c} d \bar{c} [John put [A d-tall plant] x]

As it turns out, this represents one of the two comparative readings which we earlier identified in this sentence, namely the one on which the table is compared to other places where John put plants. (The other comparative reading, with John being compared, can get a derivation analogous to (28) above, of course.)

7. Comparison of analyses

What would it take to decide between the movement theory sketched in section 6 and the theory from the earlier sections, which did not allow movement of *-est* out of a DP, and which I will therefore now call the "in-situ theory"²⁵? The latter is at first sight more appealing, because it invokes only assumptions that are either immediately obvious or established independently of superlatives. The movement theory adds two non-obvious assumptions: that superlative DPs may be covertly indefinite, and that the superlative affix may be interpreted far away from its surface location. It also has the discomfiting consequence that there will typically be two different analyses for what seems to be one given reading of a given sentence. We cannot exclude, after all, that the context-variable C_1 in an LF like (30) happens to refer to the set of mountains climbed by John, Mary, or Bill.

(30) John climbed [THE [C_1 -est] \bar{c} d[d-high mountain]]

If it does, this LF expresses a reading that is practically indistinguishable from the one that (31) expresses when C_2 consists of John, Mary, and Bill.

(31) John [C_2 -est] \bar{c} d[climbed [A d-high mountain]]

So it seems that the movement theory provides lots of redundant representations for readings that could already be generated in the in-situ theory.

Such considerations may initially tip the balance in favor of our initial approach, but I would like to argue that a less superficial examination yields the opposite verdict.

A subtle difference in predicted truthconditions

I just made it sound as if (30) and (31) had identical truth conditions for $C_1 = \{y: y \text{ is a mountain climbed by John, Mary, or Bill}\}$ and $C_2 = \{\text{John, Mary, Bill}\}$. But this is not strictly true.

Imagine, for instance, that there is a mountain which was climbed by both John and Bill and which is higher than any other mountain climbed by John, Mary or Bill. In this case, (30) is true but (31) is false. This observation could potentially give us an empirical test for the existence of *-est*-movement: If speakers perceived a reading in (1) which is falsified by this kind of scenario,

²⁵This name may not be quite appropriate if prenominal superlatives always involve short movement of *-est*, even in the "in situ" theory (see note 6). The crucial difference is that what I here call the "movement theory" allows extraction beyond the immediately dominating DP.

this would *prima facie* support the movement analysis, and if they didn't, that would weigh against it.

The evidence is mixed. Most speakers I have asked find it very hard to accept a text like (32) as true and coherent - quite unlike (33), for instance, which everybody finds perfectly natural.

(32) John didn't climb the highest mountain: Bill climbed one just as tall, in fact the same one.

(33) John isn't the tallest man: Bill is equally tall.

On the other hand, the following example sounds good.

(34) Wenn niemand eindeutig den höchsten Berg besteigt,
if nobody unambiguously the highest mountain climbs
wird der Preis nicht vergeben.
is the prize not awarded

The in-situ theory directly predicts that (32) should be nonsense, whereas the movement theory by itself has nothing to say about why it should be odd. Perhaps it could be supplemented by some plausible story about why an LF like (30) is so strongly dispreferred over competing construals of sentence (1) that it is unavailable in practice, but I don't know what such a story might amount to. But I also don't see how (34) might be accounted for without something essentially like the movement theory.

Intensional contexts again

We saw in section 4 that the in-situ theory had a problem with superlatives in intensional contexts. The movement theory compares very favorably in this respect. Consider again our example (18), repeated here.

(18) John wants to climb the highest mountain.

If we construe *the highest mountain* as indefinite and choose to move *C -est* to the edge of the matrix VP, we obtain the following LF:

(35) John [C -est] $\square d$ [want_{w0} $\square w$ [PRO to climb_w A d-high_w mountain_w]]

This straightforwardly represents the reading we had such difficulty generating on the in-situ approach. The functional abstract $\square d[...]$ denotes the relation that *x* bears to *d* iff *x* wants to climb a *d*-high mountain (under the *de dicto* reading of the latter). Applying the superlative *C -est* to this, we get the property which is true of *x* iff there is a degree *d_x* such that *x* wants to climb a *d_x*-high mountain and no member of *C* other than *x* wants to climb a *d_x*-high mountain. If *C* is {Mary, John, Bill} and the facts are as in our survey scenario, then John has this property, thus (35) is correctly predicted true.

Island constraints on comparative readings?

In principle, long-distance *-est*-movement in complex sentences should enable us to generate many readings that could not possibly be obtained under the in-situ theory and whose existence would therefore be straightforward evidence against the latter. For instance, consider the hypothetical LF derivations in (36) - (37).

- (36) John admires everyone who climbed the highest mountain.
 □ John [C -est] □d[admires everyone who climbed A d-high mountain]
- (37) John said that you climbed the highest mountain.
 □ John [C -est] □d[said that you climbed A d-high mountain]²⁶

The truth-conditions of these LFs are not found in the corresponding English sentences on any reading. The in-situ theory predicts just that. Does this discredit the movement theory? No. It is plausible that the particular movements involved in (36) and (37) violate locality constraints on movement, and if so, this suffices to explain the absence of the relevant readings.²⁷

The moral of this consideration is that clear evidence for *-est*-movement might be hard to come by even if the movement theory is correct. The syntactic constraints could turn out to be so severe that infinitival complement structures like the one in our example (18) are more or less the only cases in which *-est*-movement is both short enough to be syntactically licensed and long enough to be semantically detectable.

Definiteness effects?

Szabolcsi pointed out the relevance of data on the distribution of definites as a potential source of indirect evidence for the movement theory. For instance, she notes contrasts like (38a, b).

- (38) (a) *John has the sister.
 (b) John_F has the smartest sister.

(38a) illustrates a prohibition against definite objects with (a certain sense of) the verb *have*. On the in-situ-theory of superlatives, the object in (38b) is definite, so this example should be as bad as (38a). The movement theory can account for its grammaticality by assigning it the LF in (39).

- (39) John [C -est] □d[has A d-smart sister]

This has an indefinite after *have* and also correctly represents the meaning of (38b).

Notice that this argument primarily supports the hypothesis that superlative DPs can be indefinite, and bears on the question of *-est*-movement only rather indirectly. Unless an alternative LF like (40) can be excluded, the grammaticality of (38b) does not show that *-est* has moved.

- (40) John has A [C -est] □d[d-smart sister]

Another source of uncertainty about the force of this argument is our limited understanding of what causes the restriction to indefinites in the first place. For this and other reasons, I am not prepared to put very much weight on it yet, but it certainly is suggestive.

²⁶This is a variant on Szabolcsi's example (26a), *who said that you got the fewest letters?* The judgment she reports is that this cannot mean 'who claimed for a smaller number n than anyone else did that you got n letters?'

²⁷I don't want to suggest that a worked-out explanation of this sort is already available. Szabolcsi (1986) and Heim (1985) offer a little speculation on the nature of the applicable island constraints, but their remarks have not been followed up, much less brought together with recent syntactic theorizing on movement and locality in general. If the movement theory is on the right track, much work remains to be done here.

The role of focus

How do the two theories compare in terms of their ability to account for the disambiguating effect of focus that we looked at in section 3? We already saw how the in-situ theory could be adapted to dove-tail with an independent general theory of focus, resulting in desirable predictions. What about the movement theory? That turns out to be a very complicated question.

Since the movement theory does not exclude the LFs we employed in the in-situ theory, it predicts that, if a given instance of a comparative reading happens to be caused by context-dependency rather than long *-est*-movement, then focus may contribute in exactly the same way that we described in section 3. So, for instance, (13) on the reading comparing places could have the LF in (41), where $\square C$ denotes the set of plants that John put on the table, by the window, or on the book shelf. If the focus in this LF were shifted from *on the table* to *John*, as in (16), while leaving everything else, including the contextually supplied value for $\square C$, the same, the result would be deviant (because the focus-induced presupposition would fail).

(13) John put the tallest plant on the table_F.

(41) [the [$\square C$ -est] \square d[d-tall plant]] [\square x[John put x on the table_F] $\sim C$]

(16) [the [$\square C$ -est] \square d[d-tall plant]] [\square x[John_F put x on the table] $\sim C$]

But what if a reading comparing places is brought about by *-est*-movement? Could the placement of focus play an analogous disambiguating role in that case? Consider the following pair of potential LFs.

(42) [on the table_F $\sim C$] [C -est] \square d \square x[John put [A d-tall plant] x]

(43) on the table [C -est] \square d \square x[[John_F $\sim C$] put [A d-tall plant] x]

If the value of C is the set consisting of the three locations on the table, by the window, and on the book shelf, then it seems that (42) is a felicitous LF and (43) a deviant one: with this value for C , the presupposition of [*on the table*_F $\sim C$] is fulfilled, but that of [*John*_F $\sim C$] fails.

At this point, it looks as if the general Roothian theory of focus can provide a story about the disambiguating role of focus for the *-est*-movement structures as well. But it is doubtful that LFs like (42) and (43) actually go with PFs in which there is relative prominence on the F-marked constituents. Truckenbrodt (1995) argues that F-marking is prosodically realized as prominence relative to the non-F-marked material within the scope of the relevant \sim -operator. This implies that an F-marked node immediately below the corresponding focus-interpretation operator has no audible effect at all, and this in turn presumably means that such representations are ruled out by a principle of Full (phonetic) Interpretation. Suppose, then, we assume with Truckenbrodt that all F-marking must be limited to proper parts of the domain in which it is interpreted. It follows then, I think, that focus is predicted not be able to play any role in the choice among alternative comparative readings generated by *-est*-movement.

Can we tease out from this a testable empirical prediction? It's hard, because in most real-life examples where we intuit a "comparative" reading we can't be sure that it results by *-est*-movement. So let's use one of those intensional contexts where the truth-conditions give us a way to decide. Take the following minimal pair.

(44) John_F wanted Mary to climb the highest mountain.

(45) John wanted Mary_F to climb the highest mountain.

We concentrate on readings with a de dicto interpretation of *A d-high mountain*, but a comparison on the matrix level. The empirical question is whether the choice between the following two such readings is (ceteris paribus) dependent upon the placement of prominence on *John* or *Mary*.

(46) John [C -est] □d[wanted Mary to climb A d-high mountain]

(47) Mary [C -est] □d□x[John wanted x to climb A d-high mountain]

It seems to me that the answer is 'yes', i.e., that the effect which focus is felt to have in this case is no different than in simpler examples like (13). So I conclude very tentatively that the movement theory is less successful than the in situ theory when it comes to explaining the role of focus in the interpretation of superlative sentences.

There are many if's and but's here, of course. I have reasoned strictly on the basis of a Roothian theory of focus, which maintains that all disambiguating effects of focus marking are mediated by a single, unambiguous, focus-interpretation operator. The picture changes completely if we allow, say, that F-marking may be visible to conditions on the well-formedness of LFs. Szabolcsi (1986), for instance, stipulates that *-est* must have a trace of either focus-movement or wh-movement in its scope at LF, and thereby directly derives the prediction that (apart from cases of wh-movement) the external argument of moved *-est* bears obligatory focus. I have already raised a doubt about the descriptive accuracy of this generalization, but quite apart from this, the Roothian theory that I am presupposing in this paper excludes an analysis like Szabolcsi's in principle.²⁸

Summary

Its ability to handle certain readings of superlatives in intensional contexts remains the clearest advantage of the movement theory. We have seen sketches of some additional potential arguments in its favor, but nothing decisive. As for arguments against it, we had difficulty reconciling it with Rooth's general theory about truth-conditional reflexes of focus. It is this difficulty which motivates me to explore another variant of the movement analysis that I will introduce in the next section.

8. Synthesis: only *-est* takes scope

Excursion: brief history of the semantics of *only*

- (57) Horn 1969:
 Only Muriel voted for Hubert.
 $\square x: x \neq \text{Muriel} \rightarrow \neg x \text{ voted for Hubert}$
 $\text{only}(x,P) \square \square y: y \neq x \rightarrow P(y)$

²⁸Szabolcsi explicitly acknowledged this, and accordingly perceived a potential problem for Rooth. I believe that the case for Rooth's approach looks stronger overall today than it did in 1986, but it is far from established beyond doubt.

- (58) Anderson 1972:
John only introduced $Bill_F$ to Sue.
means: 'John introduced [only Bill] to Sue'
Bill and/or *only* move, so that *Bill* is 1st argument of *only* at LF.
- (59) John only introduced $Bill_F$ to Sue_F
means: 'Only $\langle Bill, Sue \rangle$ is a pair $\langle x, y \rangle$ such that John introduced x to y '
- (60) Rooth 1985, 1992:
Let p be a proposition, C a set of propositions:
only(p, C) \equiv p is true & [$\exists q: q \neq p$ & $q \in C$] \neg [q is true]
presuppositional constraints on C : $p \in C$ & $\exists q \in C: q \neq p$
- (61) LF: [C only] [John introduced $Bill_F$ to Sue]
 C = the set of propositions of the form 'John introduced x to Sue'
resulting interpretation:
John introduced Bill to Sue & every other proposition of the form 'John introduced x to Sue' is false.

What does focus on *Bill* have to do with this setting for the value of C ?

- (62) Assignment of focus values to LFs:
focus value of $Bill_F$:
the set of entities of the same type as Bill (i.e., the set of individuals)
focus value of *John introduced $Bill_F$ to Sue*:
the set of propositions of the form 'John introduced x to Sue'
containing one such proposition for each x in the focus value of $Bill_F$
- (63) Focus Interpretation operator:
revised LF: [C only] [[John introduced $Bill_F$ to Sue] $\sim C$]
 $\square \sim C$ adds a presupposition that C is a subset of the focus value of \square ;
otherwise ' $\sim C$ ' has no effect on meaning, i.e. $\square \sim C$ denotes the same thing as \square .

Back to superlatives

- (64) John is tallest
= there is a degree to which only John is tall
John is angriest at $Mary_F$
= there is a degree to which John is angry only at Mary
- (65) new semantics for *-est*: no external argument
Let P be a property of degrees, C a set of such properties.
-est(P, C) \equiv $\exists d (P(d) \& [\exists Q: Q \neq P \& Q \in C] \neg Q(d))$
presuppositions: $P \in C$ & $\exists Q \in C: Q \neq P$
- (66) new LF for *John is tallest*:
is [C -est] $\exists d$ [John d tall]
 C = the set of degree-properties of the form $\exists d[x$ is d -tall]
resulting interpretation:
 $\exists d (\text{John is } d\text{-tall} \& d \text{ has no other property of the form } \exists d[x \text{ is } d\text{-tall}])$

- (67) d has no property of the form $\Box d[x \text{ is } d\text{-tall}]$ other than $\Box d[\text{John } d \text{ tall}]$ \Box
no x other than John is d -tall
- (68) John is angriest at Mary
LF: is $[C \text{ -est}] \Box d[\text{John } d \text{ angry at Mary}]$
some options for values of C
- (a) $C =$ the set of degree-properties of the form $\Box d[x \text{ is } d\text{-angry at Mary}]$
(b) $C =$ the set of degree-properties of the form $\Box d[\text{John is } d\text{-angry at } x]$

Focus effects and absolute/relative ambiguities

- (69) One LF for (68):
is $[C \text{ -est}] [\Box d[\text{John } d \text{ angry at Mary}_F] \sim C]$
Added presupposition: all properties in C are of the form $\Box d[\text{John is } d\text{-angry at } x]$.
Compatible with choice (68b), eliminates choice (68a).
- (70) LFs for relative readings of (22):
(a) $[C \text{ -est}] [\Box d[\text{John}_F \text{ wrote the } d\text{-long letter to Mary}] \sim C]$
focus-induced presupposition: all properties in C are of the form
 $\Box d[x \text{ wrote a } d\text{-long letter to Mary}]$
(b) $[C \text{ -est}] [\Box d[\text{John wrote the } d\text{-long letter to Mary}_F] \sim C]$
focus-induced presupposition: all properties in C are of the form
 $\Box d[\text{John wrote a } d\text{-long letter to } x]$
- (49) John is angriest at Mary.
(a) John is angrier at Mary than anyone else is.
(b) John is angrier at Mary than he is at anyone else.
- (50) reading (b) in the scope analysis:
John is -est angry at Mary
 \Box (QR *Mary*) $\text{Mary } \Box x[\text{John is -est angry at } x]$
 \Box (move -est) $\text{Mary -est } \Box d \Box x[\text{John is } d \text{ angry at } x]$
- (51) Can reading (b) be derived without -est-movement? Best attempt:
John is -est [angry at Mary]
 \Box (lower *John*) is -est [John angry at Mary]
 \Box (raise *Mary*) is $\text{Mary } \Box x \text{-est } \Box d[\text{John is } d \text{ angry at } x]$
wrong semantic type for argument of -est!

multiple compared items:

- (52) John was most grateful to Mary for the cat food.
relevant reading: John was more grateful to Mary for the cat food than he was to anyone else for anything else.

- (53) best attempt at deriving an LF in the scope theory:
 John was -est grateful to Mary for the cat food
 \square Mary \square x[John was -est grateful to x for the cat food]
 \square Mary the cat food \square y \square x[John was -est grateful to x for y]
 \square Mary the cat food -est \square d \square y \square x[John was d grateful to x for y]
 not the required semantic type for argument of -est

Excursion: only

- (54) Horn 1969:
 Only Muriel voted for Hubert.
 $[\square x: x \neq \text{Muriel}] \neg x$ voted for Hubert
 $\text{only}(x,P) \square [\square y: y \neq x] \neg P(y)$
- (55) Anderson 1970:
 John only introduced Bill_F to Sue.
 means: 'John introduced [only Bill] to Sue'
Bill and/or *only* move, so that *Bill* is 1st argument of *only* at LF.
- (56) John only introduced Bill_F to Sue_F
 means: 'Only $\langle \text{Bill}, \text{Sue} \rangle$ is a pair $\langle x,y \rangle$ such that John introduced x to y'
- (57) Rooth 1985, 1992 (simplified):
 Let p be a proposition, C a set of propositions:
 $\text{only}(p, C) \square p$ is true & $[\square q: q \neq p \ \& \ q \in C] \neg q$ is true
 presuppositional constraints on C: $p \in C \ \& \ \square q \in C: q \neq p$
- (58) LF: [C only] [John introduced Bill_F to Sue]
 C = the set of propositions of the form 'John introduced x to Sue'
 resulting interpretation:
 John introduced Bill to Sue & every other proposition of the form 'John introduced x to Sue' is false.

What does focus on *Bill* have to do with this setting for the value of C?

- (59) Assignment of focus values to LFs:
 focus value of Bill_F :
 the set of entities of the same type as Bill (i.e., the set of individuals)
 focus value of *John introduced Bill_F to Sue*:
 the set of propositions of the form 'John introduced x to Sue'
 containing one such proposition for each x in the focus value of Bill_F
- (60) Focus Interpretation operator:
 revised LF: [C only] [[John introduced Bill_F to Sue] \sim C]
 $\square \sim C$ adds a presupposition that C is a subset of the focus value of \square ;
 otherwise ' $\sim C$ ' has no effect on meaning, i.e. $\square \sim C$ denotes the same thing as \square .

A different context-dependency theory of the superlative

- (61) John is tallest
 = there is a degree to which only John is tall
 John is angriest at Mary_F
 = there is a degree to which John is angry only at Mary
- (62) new semantics for *-est*: no external argument
 Let P be a property of degrees, C a set of such properties.
-est(P, C) $\equiv \exists d (P(d) \ \& \ [\exists Q: Q \neq P \ \& \ Q \in C] \ \neg Q(d))$
 presuppositions: $P \in C \ \& \ \exists Q \in C: Q \neq P$
- (63) new LF for *John is tallest*:
 is [C -est] $\exists d$ [John d tall]
 C = the set of degree-properties of the form $\exists d$ [x is d-tall]
 resulting interpretation:
 $\exists d (\text{John is d-tall} \ \& \ d \text{ has no other property of the form } \exists d$ [x is d-tall])
- (64) d has no other property of the form $\exists d$ [x is d-tall] \equiv
 no x other than John is d-tall
- (65) John is angriest at Mary
 LF: is [C -est] $\exists d$ [John d angry at Mary]
 some options for values of C
 (a) C = the set of degree-properties of the form $\exists d$ [x is d-angry at Mary]
 (b) C = the set of degree-properties of the form $\exists d$ [John is d-angry at x]
- (66) effect of focus:
 LF: is [C -est] $[\exists d$ [John d angry at Mary_F] \sim C]
 Added presupposition: all properties in C are of the form $\exists d$ [John is d-angry at x].
 Compatible with choice (b), eliminates choice (a).

Our ambiguity again:

- (67) LFs for comparative readings of (3):
 (a) [C -est] $[\exists d$ [John_F wrote A d-long letter to Mary] \sim C]
 focus-induced presupposition: all properties in C are of the form
 $\exists d$ [x wrote a d-long letter to Mary]
 (b) [C -est] $[\exists d$ [John wrote A d-long letter to Mary_F] \sim C]
 focus-induced presupposition: all properties in C are of the form
 $\exists d$ [John wrote a d-long letter to x]