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ON THE COMPARATIVE AND ABSOLUTE READINGS OF SUPERLATIVES*

ABSTRACT. This paper deals with an ambiguity of superlative noun phrases first noticed in Szabolcsi (1986) and discussed in Heim (1985), but which has not been studied in the subsequent literature. After discussing in detail the special properties of the comparative reading, we develop a semantics for both readings and show how it accounts for these properties.

1. INTRODUCTION

The phenomenon this paper is concerned with was noticed in Szabolcsi (1986), who points out that the superlative in (1) gives rise to the two interpretations paraphrased in (2):

(1) Who climbed the highest mountain?

(2) *Absolute Superlative*:
Who climbed Mt. Everest?
Comparative Superlative:
Who climbed a mountain that was higher than what anybody else climbed?

Note that *Nobody* is a felicitous answer to (1) under the absolute but not under the comparative reading. Szabolcsi (1986) is mainly concerned with identifying the conditions under which the comparative reading of superlatives arises and the ways in which it differs from the absolute reading. Crucially, she shows that the comparative reading arises only in the presence of a licensing operator under some locality condition and, furthermore, that the comparative superlative differs from the absolute superlative

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in that it patterns with indefinites with respect to certain tests. Szabolcsi outlines a syntactically based account under which the comparative superlative is categorially different from its absolute counterpart.

The comparative superlative receives considerable attention in Heim (1985) as well, a work whose primary concern is the semantics of comparatives.[1] In sections 4 and 5, Heim provides an explicit semantics of superlatives, which addresses the problem at hand and in which the difference between the two readings is located at LF.

In this paper we propose an alternative account in which the special properties of comparative superlatives follow from semantic rather than syntactic considerations. Our proposal goes further than previous work in capturing the properties of comparative superlatives noted by Szabolcsi and rests on syntactic assumptions that are compatible with current theories. In particular, the account we propose is consistent with the basic ideas of the Minimalist Program of Chomsky (1995); the conditions that govern the comparative superlative reading can be seen as bare output conditions imposed by its semantics. Since our account of the ambiguity makes no use of movement rules, it is also consistent with mono-stratal syntactic theories.

We start by reviewing the properties of comparative superlatives that have to be captured and outline Szabolcsi's account of them (section 2). We then go on to propose a semantics for superlatives (section 3), where we also return to Heim's proposals. Section 4 shows that the properties established in section 2 are driven by semantics and therefore need not be derived from syntactic principles, while section 5 is a brief conclusion.

In what follows, all example sentences that are not in English are in Hungarian. Hungarian is particularly pertinent to the discussion of comparative superlatives because issues involving focus play a crucial role in this discussion and because the presence or absence of a focused constituent is syntactically marked by word order in Hungarian.

2. PROPERTIES OF THE COMPARATIVE SUPERLATIVE

2.1. *Licensing*

Szabolcsi (1986) observes that the comparative reading of the superlative arises only in the presence of a licensing operator: a focus, as in (3a), an interrogative operator, as in (3b), or a relative *wh*-phrase, as in (3c).

(3)a. JOHN climbed the highest mountain.

[1] Heim (1985) remains, unfortunately, unfinished and unpublished, but because of its depth, explicitness, and popularity we will treat it as being part of the literature.

b. Who climbed the highest mountain?

c. I know the man who climbed the highest mountain.

The fact that in sentences with no *wh*-operator the presence of the comparative reading of the superlative requires a focus phrase is more obvious in Hungarian than in English because of the special surface syntactic position focused constituents must occupy in Hungarian. The connection between focus and the existence of the comparative reading of the superlative will therefore be illustrated with Hungarian examples. Thus, consider the sentences in (4):

(4)a. [$_{FP}$ JÁNOS mászta [$_{VP}$ meg a legmagasabb hegyet]]
John climbed PERF the highest mountain
It was John who climbed the highest mountain.

b. [$_{TopP}$ János [$_{VP}$ meg- mászta a legmagasabb hegyet
John PERF climbed the highest mountain
John climbed the highest mountain.

c. [$_{TopP}$ János [$_{FP}$ A LEGMAGASABB HEGYET mászta
John the highest mountain climbed
meg]]
PERF
It was the highest mountain that John climbed.

Focused constituents in Hungarian are immediately followed by the V, with verbal particles, such as the perfectivizing *meg*, occurring in post-verbal position. Following Brody (1990), we assume that the focused constituent occupies the specifier of a focus projection (FP), and triggers V-movement from behind the verbal particle into the phonologically empty F head. FP can be dominated by quantifier and topic projections (QP and TopP), but neither the quantifier in Spec,QP nor the topic in Spec,TopP trigger V-movement into Q and Top respectively, and therefore the order XP V Prefix arises if and only if XP is a focused constituent.

Now sentences (4a) and (4c) contain a focused constituent, associated in the semantics with a focus operator whose domain is a set of persons in (4a) and a set of mountains in (4c). The focused constituent (capitalized in our examples) exhaustively identifies that element of this set of which the predicate holds. (For a discussion of the exhaustiveness condition on

preverbal focused constituents in Hungarian, see É. Kiss (1998).) In (4a), where the focused constituent is not the noun phrase containing the superlative, the superlative may receive both the absolute and the comparative readings. In (4b), which is focusless, and in (4c), where the noun phrase with the superlative itself is focused, the comparative reading is absent. In (5) below we show that a superlative which lacks an absolute reading is ungrammatical in a focusless sentence.[2]

(5)a. [$_{FP}$ JÁNOS itta [$_{VP}$ (meg) a legkevesebb bort]]
John drank (PERF) the least wine
It was John who drank the least wine.

b. *[$_{TopP}$ János [$_{VP}$ (meg) itta a legkevesebb bort]]
John (PERF) drank the least wine
John drank the least wine.

c. *[$_{TopP}$ János [$_{FP}$ A LEGKEVESEBB BORT itta (meg)]]
John the least wine drank (PERF)
It was the least wine that John drank.

Based on these data, Szabolcsi (1986) concludes that in the absence of a *wh*-operator the presence of a focused constituent other than the superlative is required in order for the comparative reading of a superlative to arise. She suggests that this is so because the comparative reading requires the presence of a 'licensing variable' within a particular local domain. Under this essentially syntactic account the semantics of the operator binding this variable is not relevant to the licensing of the comparative reading. As Szabolcsi herself notes, under this approach one expects sentences containing a variable bound by a universal or an existential quantifier to also allow comparative readings for superlatives. But the potentially ambiguous superlative phrases in (6a–c) only have absolute interpretations, while (6d), where the superlative can only be interpreted comparatively, are unacceptable:

(6)a. Everybody climbed the highest mountain.

b. Several/many men climbed the highest mountain.

[2] See Gawron (1995) for an account of why quantity superlatives lack an absolute reading based on the assumption that quantity superlatives are determiners. We will not deal with this issue here.

c. A man climbed the highest mountain.

d. *Everybody/a man was paid the least money.
*Many/several men were paid the least money.

In examples involving definites, the superlative may have a comparative interpretation if the indefinite is focused. Thus, (7) has a comparative reading, and (8) is acceptable. The former example would be used in a context in which groups of climbers of various ages are talked about; a natural context for the latter is one where various academic ranks are discussed.

(7) A CHILD climbed the highest mountain.

(8) A PROFESSOR was paid the least money.

No amount of stress, however, can force a comparative reading on (6a,b) or (6d).[3]

Szabolcsi (1986) does not give a conclusive account of this contrast. She suggests that perhaps 'Quantifier Raising does not leave an appropriate variable behind. Another possibility is to say that the variable they leave counts as bound within S (I")' (Szabolcsi 1986, p. 260). Given that these assumptions lack independent motivation we conclude that the data in (6) are problematic for the account sketched in Szabolcsi (1986).

These facts suggest that the semantics of the operator binding the licensing variable plays a role in licensing the comparative reading. We now discuss some further evidence that is even more problematic for a semantically blind account of the licensing of the comparative reading. Closer consideration of the data reveals that not all types of *wh*- expressions license the comparative reading of superlatives. Thus, note first that a relative *wh*-phrase can license the comparative reading only when it has a definite head, as the examples in (9) show.

(9)a. I know the man who climbed the highest mountain.

b. I know a man who climbed the highest mountain.

c. *I know a man who climbed the most mountains.

As mentioned before, (9a) is ambiguous. Example (9b), however, can only receive an absolute interpretation, while (9c), where the absolute interpretation is ruled out, is ungrammatical.

[3] We are grateful to Daniel Büring for bringing these facts to our attention.

Turning now to interrogative *wh*-operators, recall that in case the *wh*-phrase is not D-linked, they are compatible with expressions like *if any*, which, as Horn (1972a) noted, suspend the existence presupposition associated to the *wh*-phrase:

(10) Who, if anybody, wants to climb Mt. Everest?

Note, however, that the comparative reading of a superlative is not compatible with such 'suspenders'. Thus, (11),

(11) Who, if anybody, wants to climb the highest mountain?

is unambiguously interpreted as involving an absolute superlative, and thus being synonymous with (10). Note also that there are various restrictions on the class of *wh*-phrases that license the comparative reading of a superlative. Szabolcsi (1986) notes that *why*-questions do not license the comparative reading in the absence of a focused constituent; the superlative in (12) is unambiguously absolute:

(12) Miért mászta meg János a legmagasabb hegyet?
why climbed PERF John the highest mountain
Why did John climb the highest mountain?

The same is true of *when*-questions.

The facts reviewed above lead us to the conclusion that the semantic properties of the operator binding the licensing variable play a crucial role in licensing the comparative interpretation of superlative phrases. The empirical generalization we draw is given in (13):

(13) *The Licensing Condition*
The comparative reading of a superlative phrase is licensed by an operator that takes a contextually provided finite set as argument, and whose semantics is compatible with the value being a unique element of that set.

Note that the uniqueness condition in (13) is automatically met in case the licensing variable is bound by a focus operator; in the case of relative *wh*-operators, the condition is met when the head is definite, while in the case of interrogatives, it is met when the existence presupposition associated to the *wh*-phrase is not suspended.

2.2. *Locality and Primacy*

We turn now to the question of the structural relation that must obtain between the licenser and the superlative phrase. Szabolcsi (1986) tested this relation on the basis of the examples in (14).

(14)a. * Who t said [that you got the fewest letters]?
Who said that you got fewer letters than what everybody else said?

b. * Who did you warn the fewest people [that you were going to arrest t]?

c. Who did you claim t got the fewest letters?

d. Who t expected Mary to get the fewest letters?

Recall that the superlative *fewest* is not compatible with an absolute reading, and therefore the ungrammaticality of (14a,b) is evidence for the unavailability of the comparative reading. Note that in (14a) the variable bound by the *wh*-operator is in the matrix clause, while the superlative is in the embedded clause; in (14b) the reverse relation obtains. In (14c), on the other hand, the variable and the superlative are in the matrix, while in (14d) the variable is in the matrix, while the superlative is in an infinitival clause. The contrast between (14a,b) on the one hand, and (14c,d) on the other, indicates that the comparative reading is possible in the latter but not the former. This robust contrast is evidence for the existence of some locality condition on the relation between the licenser and the noun phrase containing the superlative. Pinning down the specifics of this condition turns out to be a non-trivial task.

On the basis of the contrast in (14), Szabolcsi (1986) concluded that the crucial requirement is that the superlative phrase and the licensing variable be within "the same domain with independent tense"". Szabolcsi then derives this constraint from the Empty Category Principle (ECP), which requires a non-pronominal category to be properly governed. In her account, the comparative acquires scope over the licensing variable through LF-adjunction to Infl or Infl′, and the adjunction to a superordinate node outside the immediate tense domain would cause an ECP violation. Under the assumption that the comparative reading requires the licensing variable to be in the scope of the superlative, the comparative reading of (14a) would involve the superlative raising across an independent tense domain boundary, which leaves its trace ungoverned.

There are, however, problems both with Szabolcsi's empirical generalization and with an ECP-based account of the above facts. As Szabolcsi herself notes, the explanation of the locality constraint in terms of the ECP cannot explain the unavailability of the comparative reading in (14b), in which the trace of the superlative phrase adjoined to Infl or Infl′ is properly governed, and it c-commands the licensing variable in the complement clause.

On the empirical side, there are problems with defining the locality domain in terms of 'independent tense'. The underlying assumption here is that the tense of infinitival and subjunctive clauses is dependent on the tense of the matrix, which renders their clause-boundaries transparent for ECP purposes. This account predicts that (15) may get a comparative reading, and this example is indeed cited in Szabolcsi as grammatical.

(15) Who t demanded that you get the fewest letters?
Who demanded that you get fewer letters than what everybody else demanded that you get?[4]

We found, however, that matters are more complex. First, some of our informants found (15) unacceptable. This means that formulating the locality domain in terms of independent tense might be too strong. There is evidence showing that the condition is too weak as well, since it turns out that the comparative reading of a superlative in an infinitival clause cannot always be licensed from the matrix. Thus, our informants found a contrast between (16a) and (16b,c):

(16)a. Who t wants you to get the fewest letters?
Who wants you to get fewer letters than what everybody else wants?

b. * Who t wants very much for you to get the fewest letters?
Who wants very much for you to get fewer letters than what everybody else wants?

c. * Who t is anxious for you to get the fewest letters?
Who is anxious for you to get fewer letters than what everybody else is anxious for you to get?

While the acceptability of (16a) is expected under Szabolcsi's condition, the degraded acceptability of (16b,c) is not predicted. The problem with

[4] The verb *get* here is in the subjunctive and its tense is dependent on the matrix.

these two sentences cannot be caused by the presence of the complementizer *for* because there were informants who found (16b,c) ungrammatical but (17) acceptable:

(17) Who t arranged for you to get the fewest letters?
Who arranged for you to get fewer letters than what everybody else arranged?

Although the contrast between (16a) and (17) on the one hand, and [16b,c), on the other, appears at first sight to be idiosyncratic, it in fact turns out to correlate with certain scope facts. Thus, note that the complements in (16b,c) are scope islands, unlike the complements in (16a) and (17). Consider (18): *too many people* can scope out of the infinitival complement in (18a,b), but not in (18c,d).

(18)a. John wanted her to invite too many people.

b. John arranged for her to invite too many people.

c. John wanted very much for her to invite too many people.

d. John was anxious for her to invite too many people.

Under the reading in which *too many people* scopes over *want/arrange* in (18a,b) the phrase is understood as characterizing not John's intention or arrangement but rather the speaker's evaluation of John's intention/arrangement. In this case the sentence is interpreted as saying that it was too many people that John wanted/arranged for her to invite. In (18b,c), on the other hand, too many people cannot have scope outside the infinitival complement; here the ill will of wanting her to invite too many people must be attributed to John.

The local domain of scope assignment in (18a–d) and of the relation between the licensing variable and the comparative superlative in (16a) and (17) is not an invariant syntactic domain under the standard analyses of the infinitival constructions involved. If *too many people* is assigned scope over the matrix predicate in (18a,b), its LF movement into scope position crosses one barrier (the embedded CP); in (18c–d), on the other hand, the LF movement of the same phrase cannot cross a barrier. Similarly, the superlative can enter into a relation with the licensing variable across one barrier (the embedded CP) in (16a) and (17), but cannot enter into a relation with it across a barrier in (16b,c). These facts can be generalized in

one of the following ways. (i) One can conclude that the syntactic domain of quantifier scope assignment and comparative superlative interpretation is limited to a domain transgressing at most one barrier and, within those limits, quantifier scope/superlative interpretation is further constrained lexically. (ii) One can revise the standard categorial analysis of infinitival complements. The invariance of the syntactic domain of scope assignment can be maintained under the assumption that in (18a,b) the CP is deleted, similarly to the Exceptional Case Marking construction in (14d). According to Chomsky (1981), the analysis of *want* as an ECM verb is ruled out because the subject of the infinitival complement of *want* cannot be NP-moved into the matrix subject position. The blocking of NP-movement is attributed to the intervention of the CP barrier dominating a deleted *for* complementizer, as shown in (19):

(19) *She$_i$ is wanted [$_{CP}$ [$_{IP}$ t$_i$ to invite too many people]]

However, É. Kiss (1994) claims (in a different context) that the preposing of *she* in (19) is not blocked by an alleged barrier; rather, the ungrammaticality of (19) is caused by the fact that *is wanted* simply does not subcategorize for a non-finite complement. In other words, the *want* that can be passivized is lexically different from the *want* that takes infinitival complements. Note that (20) is also ungrammatical, although it does not involve any movement across CP:

(20) *It is wanted for her to invite too many people.

Sentences like (21) also support the claim that the subject of the infinitival complement of *want* is governed by it, i.e., the infinitival complement shares the governing category of the matrix subject, hence there can be no intervening barrier between them.[5]

(21) They want each other to succeed.

In view of these facts, we propose to analyse (18a) as involving an ECM construction with the embedded subject case-marked by the matrix predicate. Under this analysis, scope assignment to *too many people* over the

[5] At the same time we have to assume the existence of a control *want*, just as one assumes both an ECM and a control *expect*. The marginal status of (i)

(i) I want myself to succeed.

can be explained by assuming that, all other things being equal, it is more economical to have a PRO without case and phonological content than an anaphor.

matrix predicate does not cross any barrier. A similar claim can be made about (18b): *arrange for* can be analyzed as a single V, subcategorizing for an IP complement and exceptionally case-marking its subject. In (18c), the exceptional case-marking of the embedded subject by the matrix predicate is prevented by the intervening *very much*, whereas in (18d) the reanalysis of *for* as part of *anxious* is presumably blocked by the fact that *for* is a case assigner but *anxious* is not; consequently, in (18c,d), the CP barrier cannot be deleted.

The analysis proposed also accounts for the facts in (16) and (17) involving comparative superlatives, under the assumption that the comparative reading of superlatives is subject to the following strict locality condition:

(22) *The Locality Condition*
The superlative and the variable bound by the licensing operator cannot be separated by a barrier.

As shown by the examples in (23), constraining the distance between the licensing variable and the comparative superlative is not sufficient; their relative prominence is a relevant factor as well:

(23)a. JOHN received the fewest votes.

b. * The fewest voters voted FOR JOHN.

c. * The fewest voters wanted to vote FOR JOHN.

d. Voters cast the fewest votes FOR JOHN.

e. The fewest votes$_i$ were cast t$_i$ FOR JOHN.

In the grammatical (23a), the licensing variable c-commands the superlative, whereas in the ungrammatical (23b–c), the superlative c-commands the licensing variable. There is no general agreement in the literature concerning the structure of the construction exemplified in (23d,e) (cf. e.g., Larson 1988 and Brody 1997) but in every approach the PP and the object NP mutually m-command each other. Therefore, on the basis of (23a–d) we conclude that the comparative reading cannot arise unless the licenser m-commands the superlative. More precisely, the licenser must m-command the root of the superlative chain, as shown by (23e), where the root and the head of the superlative chain are distinct. On the other hand, (24) shows

that what counts with respect to primacy is not the variable bound by the licensing operator but the operator itself:

(24) Who$_i$ did the fewest persons vote for t$_i$?

In (24), the superlative m-commands the variable bound by the licensing operator, but is m-commanded by the operator itself and the primacy condition necessary for the comparative reading to arise is satisfied.

The intuitive generalization that can be drawn on the basis of these facts is that in order for the comparative reading to arise, the superlative noun phrase cannot be structurally more prominent than the licensing operator. This can be expressed more formally as in (25):

(25) *The Primacy Condition*
The root of the superlative chain must be m-commanded by the licensing operator.

Note again that the version of structural prominence required in (25) is not idiosyncratic: it is parallel to the primacy condition needed for dependent scope readings. Thus, a *wh*-operator can have narrow scope with respect to a universal quantifier precisely when the root of the *wh*-chain is m-commanded by the quantifier. Compare (26a–d), where the star marks the impossibility of the narrow scope reading of the *wh*-phrase relative to the universal:

(26)a. What$_i$ did everybody order t$_i$?

b. * Who$_i$ t$_i$ ordered every drink? (dependent reading)

c. * Who$_i$ t$_i$ wanted to order everything? (dependent reading)

d. What$_i$ did you order t$_i$ for everybody?

e. What$_i$ t$_i$ was ordered t$_i$ for everybody?

The narrow scope reading of *who* (under which the things bought can covary with the persons in the domain of the universal quantifier) is blocked in (26b,c), where the universal quantifier does not m-command the root of the *wh*-chain. In (26a) and (26d–e), on the other hand, where the universally quantified PP/DP m-commands the root of the *wh*-chain, the universal may scope over the *wh*-expression. Thus, we conclude that if an operator α is

within the scope of an operator β the root of the operator-chain headed by α must be m-commanded by β.

2.3. *Specificity*

An important point made in Szabolcsi (1986) is that noun phrases containing an absolute superlative contrast with those containing a comparative in contexts sensitive to specificity/definiteness. Absolute superlatives pattern with specific/definite noun phrases, whereas comparative superlatives pattern with non-specific/indefinite expressions. Thus, superlatives in the coda of existential constructions are acceptable only under the comparative interpretation:

(27)a. * There was the largest box of chocolates on the table.

b. There was the largest box of chocolates on the table YESTERDAY.
Yesterday there was a larger box of chocolates on the table than there was on any other day.

Szabolcsi's account of this contrast involves treating absolute superlatives as definite and comparative ones as indefinite, the difference correlating with a difference in the syntactic category of their specifier. Thus, definite noun phrases are assumed to have the category N‴, while indefinites to have the category N″. Szabolcsi also notes that there are two further contexts in which comparative superlatives pattern with non-specifics/indefinites while their absolute counterparts pattern with definites: NP-splitting and partial extraction constructions (cf. Szabolcsi 1983 and van Riemsdijk 1987). Thus, comparative superlatives and indefinites, but not absolute superlatives or definites, may occur in constructions involving NP-splitting and subsequent NP-regeneration, and thus (28) is acceptable only under a comparative reading:

(28) Krimit JÁNOS olvasott a legtöbbet.
crime-story John read the most
Of crime stories, it was John who read the most.

In (29) below we see that comparative superlatives pattern with indefinites in allowing partial extraction:

(29)a. Who$_i$ did you take a picture of t_i?

b. * Who$_i$ did you take the/every picture of t_i?

c. Who$_i$ did you take the best picture of t_i?
Who did, you take a better picture of than you took of everybody else?
(Szabolcsi's (1a–c))

Note that (29c) allows only the comparative reading paraphrased here. Extraction out of absolute superlatives could be blocked by the Specificity Condition of Fiengo and Higginbotham (1981), which rules out specific noun phrases containing a variable that is not bound from within the noun phrase.

The crucial point for our purposes is that the absolute and the comparative readings of a superlative noun phrase contrast in that the comparative patterns with non-specific/indefinite noun phrases, while the absolute one patterns with definite ones.[6]

The empirical observations in this subsection fall under the generalization in (30):

(30) *The Non-Specificity Effect*
In syntactic constructions sensitive to specificity, noun phrases containing a superlative pattern with non-specific/indefinite noun phrases under the comparative interpretation, and with specific/definite noun phrases under the absolute interpretation.

To sum up now, a comprehensive account of noun phrases containing a superlative has to capture the following generalizations: (i) the comparative reading of the superlative arises only in the presence of a certain type of operator (the Licensing Condition in (13); (ii) the comparative superlative and the licensing operator are subject to locality conditions (the Locality Condition in (22) and the Primacy Condition in (24)); (iii) there are constructions in which the comparative superlative patterns with non-specific/indefinite noun phrases, while the absolute superlative patterns with specific/definite ones (the Non-Specificity Effect in (30)). These generalizations have their starting point in Szabolcsi (1986). The analysis suggested there, however, leaves open several important questions. Thus, in the absence of a semantics for superlatives in general, and for comparative superlatives in particular, the special licensing conditions needed for

[6] As noted by Szabolcsi, this contrast may not be explained by making reference to some default or non-deictic nature of the definite article of superlative noun phrases in general since then we would expect absolute superlatives to pattern with indefinites as well. As noted by Heim (1985, p. 20), semantic analyses of superlatives which treat superlative noun phrases as semantically indefinite, as the one she proposes, cannot account for why absolute superlatives pattern with definites.

the comparative reading to arise are left unexplained. Furthermore, the categorial difference between the two types of superlatives that Szabolcsi uses to capture the Non-Specificity Effect remains stipulative since the difference in question is not connected to any other property of the two types of superlatives. Consequently, an analysis under which the correlation would go in the opposite direction, so that the absolute superlative would pattern with indefinites, and the comparative superlative with definites, remains equally plausible under Szabolcsi's approach. Heim (1985) develops a semantics for both varieties of superlatives, the details of which will be discussed below, but not much attention is paid there to the generalizations in (i)–(iii). In the next section, we propose a semantic analysis of superlatives and show that it contains the key to capturing these generalizations.

3. The Semantics of Superlative Noun Phrases

In this section we give a semantics for superlative noun phrases under both the absolute and the comparative readings. After a brief overview of Heim (1985) we turn in subsection 3.2 to our own proposal.

3.1. *Heim (1985)*

Heim (1985) is primarily concerned with the semantics of comparatives. In her account, the comparative morpheme *-er* is a two-place predicate whose arguments are a pair of entities (the items compared) and a function f (the dimension of comparison), which assigns to each entity in its domain some degree. The truth conditions of a formula of the form *-er*$(\langle a, b\rangle, f)$ are as in (31):

(31) *-er*$(\langle a, b\rangle, f) = 1$ iff $f(a) > f(b)$

The translation of example (32a) is given in (32b), which is true just in case the quantity of drummers I saw exceeds the quantity of drummers you saw.

(32)a. I saw more drummers than you.

b. *-er*(⟨I, you⟩, $\lambda x\ \iota y$ (x saw y-many drummers))

The lambda expression here assigns to each individual x the quantity of drummers x saw.

The superlative morpheme *-est* is a two-place predicate, just like the comparative one, except its first argument is a pair made up of an individual and a set, and the truth conditions associated with it are as in (33).

(33) *-est*$(\langle a, B\rangle, f) = 1$ iff $\forall x \in B \backslash \{a\}$: $(a) > f(x)$

In the above formula, a is the correlate of the superlative, B is the set that forms the field of comparison, while f is, as before, a function which provides the dimension of comparison. The field of comparison is either explicitly or contextually provided. The ambiguity between the absolute and the comparative reading is a matter of how the correlate and the function f are chosen. Under the absolute reading of our example sentence *John climbed the highest mountain*, the correlate is the referent of the noun phrase containing the superlative, the set to be ordered is a contextually provided set of mountains, and f is a function that assigns to each entity in its domain the degree to which that entity is high. Under the comparative reading, the correlate is John, the set to be ordered is a contextually provided set of individuals, and f is a function that orders entities by height of mountains they climbed, i.e., it is an expression of the form $\lambda x\ \iota y$ [*x climbed a y-high mountain*]. Under the absolute reading, the sentence is true iff John climbed a mountain that is higher than all the other mountains in some contextually provided set of mountains; under the comparative reading, the sentence is true iff the height of the mountain climbed by John exceeds the height of the mountains climbed by some contextually provided set of individuals.[7]

Under this analysis, there is a systematic discrepancy between the surface position of the comparative and superlative morphemes that is particularly obvious in the comparative superlative case, where the superlative morpheme is semantically the main predicate. This tension is solved by assuming that comparison morphemes are assigned scope by the obligatory LF movement rule in (34) (Heim's (49), p. 30):

[7] The above analysis, as it stands, gives the wrong results for scenarios in which one or more climber climbed several mountains, since $f(x)$ is the height of some mountain climbed by x but not necessarily the height of the highest mountain x climbed. With the function f constructed as above, our example sentence is true as long as for every climber y other than John there is some mountain m that y climbed such that m is lower than some mountain m' that John climbed. Consider a model where the climbing relations are as in (i), and the ordering of mountains by height is as in (ii).

(i) $\langle$John, $m_2\rangle$; $\langle$Paul, m_1, $m_3\rangle$; $\langle$Susan, $m_4\rangle$

(ii) $m_1 > m_2 > m_3 > m_4$

Our example sentence is true in this model if f associates to Paul the height of m_3 rather than that of m_1. This is not a desirable result.

(34) *Comparison Operator Scope Assignment*

Adjoin OP to some containing predicate X while turning the latter into a function. More precisely, perform the following change:

$[_{X_x} \ldots [_{DET_y}$ OP$] \ldots] \Rightarrow [_{X_x}$ OP $\langle x, (..)\rangle\ \lambda x\ \iota y\ [_{X_x} \ldots [_{DET_y}$ _ _$] \ldots]]$

The absolute reading of superlatives results from moving the superlative morpheme over the descriptive content of the noun phrase containing the superlative; the comparative reading results from moving the superlative over the predicate containing this noun phrase.

A significant result this analysis achieves is that it gives a unified treatment of the absolute/comparative ambiguity and the ambiguity of sentences like (35),

(35) I sent better drummers to you than Karlheinz.

where the two readings result from choosing different landing sites for the comparative morpheme and, therefore, having different dimensions of comparison.

Turning now to the properties of the comparative reading, which form our main concern here, note that the licensing conditions would have to follow from constraints on the LF movement of the superlative, an issue that Heim leaves open. Furthermore, as already mentioned, Heim also notes that the Non-Specificity Effect is unaccounted for, since superlatives under both the absolute and the comparative readings are not definite semantically. What comes as a surprise then is not that the comparative patterns with indefinites but that the absolute does not. Furthermore, since under this analysis the noun phrase containing the superlative morpheme is the correlate of the superlative in the absolute reading, one expects this noun phrase and the correlate of comparative superlatives to behave similarly. This prediction is not borne out. Thus, we saw in section 1 that when the correlate of comparative superlatives is not a *wh*-phrase it has to be focused and, in Hungarian, this has consequences concerning word order. Heim's analysis predicts that noun phrases containing absolute superlatives will have to be focused since the referential index of these noun phrases is the correlate of the superlative. That this is not the case is shown by the well-formedness of (4b), repeated here as (36):

(36) $[_{TopP}$ János $[_{VP}$ meg- mászta a legmagasabb hegyet]]

John PERF climbed the highest mountain

John climbed the highest mountain.

In section 4 we argue that the alternative proposal developed in the rest of this section goes further than Heim (1985) in accounting for the properties of the comparative reading discussed in section 2. On the theoretical side, note that Heim's account rests on (34), an operation that moves an expression at LF and at the same time inserts a new constituent (the first argument of the operator), and changes the interpretation of the constituent the operator is adjoined to in a way that crucially involves the index of the Determiner the operator initially found itself in. The analysis we propose below is developed within a framework where LF operations with such drastic semantic consequences are not allowed. The burden of the analysis we propose is borne by semantics alone, and thus a tighter syntax/semantics interface can be maintained.

3.2. *The Semantics of Superlative Noun Phrases*

Our analysis builds on the proposals in Kennedy (1997) concerning the syntax and semantics of gradable adjectives. Those aspects of Kennedy's proposals that are crucial to our own will be summarized below.

We assume that the syntax of noun phrases containing a superlative is as in (37).

(37)a. $[\mathrm{D}_{DP}\ [_{D}$ the$]\ [_{NP}\ [_{DegP}\ [_{Deg}$ -est$]\ [_{AP}$ high$]]\ [_{N'}$ mountain$]\ ]\ ]$

Here APs are taken to project a degree phrase ($DegP$), as argued for most recently in Kennedy (1997). The further details of the structure of APs are not relevant to our present purposes and therefore will be glossed over.

Our analysis of the semantics of superlatives assumes the semantics of gradable adjectives developed in Kennedy (1997). The aspects of Kennedy's approach that are relevant here are the following. (i) Semantically, gradable adjectives are measure functions from entities to extents on a scale.[8] (ii) Expressions involving a gradable adjective ϕ predicated of some argument x involve three semantic components: (a) a reference value, $\phi(x)$, (b) a standard value, $\phi(y)$, and (c) a comparison relation that takes these two values as arguments. The reference value is given by applying the denotation of the adjective to the denotation of the subject in examples such as (38) and (39) below.

(38) Benny is tall.

(39) Benny is taller than Nick.

[8] The fact that the range of adjectives is taken to be extents on a scale rather than degrees is tangential to our proposal. This view of adjectives originates in Bartsch and Venneman (1972).

The standard value is contextually supplied in absolute constructions such as (38), while in comparatives such as (39) it is the result of applying the denotation of the adjective to the denotation of the argument of *than*. The comparison morpheme determines what the comparison relation is: the relation is $>$, $<$ or = depending on whether the comparison morpheme is *-er, less* or *as*. Absolute constructions involve an implicit ordering relation ($>$ in the case of positive adjectives and $<$ in the case of negative ones).

Example (38) is true iff the reference value is bigger than the contextually supplied standard, i.e., if Benny's height exceeds the contextually established standard; (39) is true iff the reference value is bigger than the standard value, i.e., if Benny's height exceeds Nick's. In what follows, the argument that gives the reference value (Benny in (38) and (39)) will be called the r-argument, while the argument that serves to give the standard value (Nick in (39)) will be called the s-argument.

Below, we extend this approach to superlatives, and in particular, to superlative noun phrases. What is special in their case is that both the r- and the s-arguments are elements of a set D (the field of comparison), and moreover, the s-argument is a universally bound variable that ranges over those elements of D that are different from the r-argument. The comparison relation is $>$ in case the comparison morpheme is – *est*, and $<$ in case it is *least*. In a noun phrase like *the highest mountain in the US*, the field of comparison is the set M of mountains in the US. The r-argument is the referent of the noun phrase, an element $m \in M$. The s-argument is a variable ranging over those elements of M that are different from m, and the comparison relation is $>$. The referent of the noun phrase must be such that its height exceeds the height of every other element in M. Thus, the noun phrase refers to that element $m \in$ M such that $\forall m'(m' \in M \wedge m' \neq m) \rightarrow high'(m) > high(m')$.

We turn now to the details of the interpretation of noun phrases of the form in (37). As mentioned above, gradable adjectives denote measure functions, and thus *high* denotes a function *high*′ from entities to extents on a scale of height. The superlative morpheme *-est* is a function that takes adjectives as arguments and gives $DegP$ denotations as values:

(40) $\lambda A\, \lambda R\, \lambda y\, (R(y) \wedge \forall y'[(R(y') \wedge y' \neq y) \rightarrow A(y) > A(y')])$

Here R is a variable over predicates and A is a variable over gradable adjectives. In (37) then, *-est* takes *high*′ as argument and the result is a $DegP$ denotation. The denotation of a $DegP$ is a function from a set D, *the field of comparison*, to the singleton subset of D whose element, d, is such that for every $d' \in D$ such that $d' \neq d$, $Adj'(d)\ r\ Adj'(d)$, where r is $>$ if the comparison morpheme is *-est* and $<$ if it is *least*. The

denotation of a $DegP$ will be called a superlative function. In our example, the denotation of the $DegP$ highest is as in (41):

(41) $\lambda R\, \lambda y(R(y) \wedge \forall y'[(R(y') \wedge y' \neq y) \rightarrow high'(y) > high'(y')])$

We arrive at this expression after applying *-est* to *high*.

The argument of the superlative function, the field of comparison, is given by the interpretation of N', the sister of the $DegP$ in (37). If this set fails to have an element that exceeds all the others relative to the function denoted by the adjective, the superlative DP fails to refer. In our example, the field of comparison is a set of mountains whose characteristic function is λz (*mountain*$'(z)$). The interpretation of the NP *highest mountain*, given in (42), is arrived at by applying the superlative function in (41) to the interpretation of N'.

(42) λy(*mountain*$'(y) \wedge \forall y'$ [(*mountain*$'(y') \wedge y' \neq y) \rightarrow$ *high*$'(y)$ $>$ *high*$'(y')$])

Taking the definite article to translate as an iota operator that binds the variable contributed by its sister, the interpretation of the DP in (37) is as in (43):

(43) ιy (*mountain*$'(y) \wedge \forall y'$ [(*mountain*$'(y') \wedge y' \neq y) \rightarrow$ *high*$'(y)$ $>$ *high*$'(y')$])

The referent of the DP is that element of the set denoted by the N' constituent that exceeds all the others relative to the dimension provided by the adjective, i.e., the mountain that exceeds all the others relative to height.

A formal difference between this analysis and Heim's that we exploit below is that under the present account superlatives involve quantification over a domain constructed on the basis of the field of comparison and an identity/difference condition: the s-argument ranges over those elements of the field of comparison that are different from the r-argument. Despite obvious differences, in both approaches the superlative involves the comparison of one entity (the value of the r-argument) with all its fellow members (the values of the s-argument) in some set relative to some dimension. The set is the field of comparison, and the dimension is provided by the interpretation of the adjective. Under the present proposal, however, the interpretation of the *-est* morpheme is done *in situ*. This is an advantage because it permits syntactic distribution to parallel semantic function, and therefore it explains why superlative morphemes, as well as comparative

ones, tend to occur crosslinguistically in construction with an adjective or adverb.[9]

3.3. *Varieties of Absolute Superlative Noun Phrases*

3.3.1. *Pragmatically Restricted Fields of Comparison*

The semantics given above results in the absolute reading of superlative noun phrases. In this subsection we briefly discuss some ways in which the field of comparison in absolute superlatives may be restricted in order to better distinguish the comparative variety from its closest absolute relatives. Recall that the field of comparison is given by the interpretation of the N' constituent. In a noun phrase like our example *the highest mountain*, where N' is made up only of its head, *mountain*, if the field of comparison is not further restricted contextually, one gets the 'absolute' absolute superlative where the field of comparison includes all the mountains in the model. In case the head noun is further explicitly modified, as in *the highest volcanic mountain*, the field of comparison is restricted to those entities that satisfy these further restrictions, i.e., to volcanic mountains. Just like with other types of quantification, the field of comparison may be implicitly restricted to some pragmatically salient subset of the denotation of N'. Thus, if in the context some particular set of mountains, say the mountains Paul climbed during this past vacation, have been made salient, the noun phrase *the highest mountain* may be interpreted with respect to a field of comparison made up only of the mountains Paul climbed during this vacation. The same mechanism is at work in restricting the domain of quantification were we to use the noun phrase *every mountain* in this context, or in case we used the definite description *the mountains* to refer to this set. We assume that such pragmatic restrictions are not reflected in the semantic interpretation of the noun phrase, i.e., that the semantic interpretation of the noun phrase makes no reference to these restrictions.

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[9] A further advantage of an analysis that does not rely on LF movement, and therefore on assigning comparative superlatives wider scope than that assigned to their absolute counterparts is that one avoids making the incorrect prediction that the two types of superlatives contrast in their scope relative to intensional predicates, for instance. Thus, if the comparative reading of superlative noun phrases involved LF movement of the whole noun phrase one would incorrectly predict that, under the comparative reading, the superlative noun phrase in (i) would only have wide scope relative to *want*.

(i) Who wants to climb the highest mountain?

Heim (1985) avoids making this prediction as well, since her analysis involves moving only the morpheme of comparison, and not the whole noun phrase.

There are noun phrases, such as those in (44), whose descriptive content specifies the field of comparison completely and therefore they are incompatible with further implicit restrictions, pragamatic or otherwise.

(44) the highest mountain in the US; the tallest among Peter, Paul and Mary; the best among the students I have ever taught

A hitherto unnoticed property of these noun phrases is that they do not allow the comparative reading. Thus, (45) is unambiguous, and the superlative may only refer to Mt. McKinley.

(45) Who climbed the highest mountain in the US?

The analysis presented in the next subsection accounts for this fact.

3.3.2. *Dependent Absolute Superlative Noun Phrases*

We discuss below a variety of superlative noun phrase that has not been previously recognized, and since it comes closest to the comparative reading it merits special attention. Consider first the narrow scope reading of the indefinite in (46),

(46) Every student climbed a mountain.

where the value of the variable introduced by the indefinite co-varies with the variable bound by the universal. Following Farkas (1997a) we call this indefinite dependent on the universal. Note now that definite noun phrases may also have such dependent readings. In a context where it is assumed that every child was given a lunch box containing a sandwich and a cookie, the noun phrase *the cookie* in (47),

(47) Every child ate the cookie first.

is most naturally interpreted as co-varying with the child. Under this interpretation the sentence states that every child ate the cookie in his/her lunch box first.[10] In order for definites to have a dependent reading, the context must provide some way of associating the elements in the domain of the universal with a unique entity that may serve as value to the definite, or, alternatively, such an association must be accommodatable in the discourse. We assume that this restriction is connected to the uniqueness/familiarity requirement associated with definites.

[10] See Farkas (1997b) for discussion.

Now if definites may have a dependent interpretation and superlative noun phrases are definite, one expects superlatives to exhibit dependent interpretations in appropriate contexts as well. Indeed, in a context where it has been established that some set of mountains was associated to each element of a set of students, the superlative in (48),

(48) Every student climbed the highest mountain.

may receive a dependent interpretation, where it is asserted that for every student x, x climbed the mountain that was highest among the mountains associated to x. Superlatives interpreted in this way will be called *dependent absolute superlatives*. We call this reading *dependent* because the interpretation of the superlative co-varies with the interpretation of the variable bound by the universal: different students climbed different mountains, and what mountain the superlative refers to depends on what student the noun phrase is interpreted with respect to. This is so, in our terms, because the field of comparison is established relative to the students in question: each student is contextually associated with some set of mountains that serves as field of comparison when interpreting the superlative noun phrase relative to that student. We call this reading *absolute* because when evaluating the superlative relative to some student x, mountains associated to students other than x are not part of the field of comparison. The field of comparison varies with respect to each student but in every case it is a pragmatically supplied set of mountains. We will see that matters are different with comparative readings of superlatives. We conclude this discussion with the following observations. (i) The dependency of absolute superlatives, just like the dependency of other expressions, is a semantic matter. More precisely, it is a matter of scope, which affects semantic interpretation. We do not concern ourselves here with whether this dependency is a matter of structure, as in standard accounts of scope, or a matter of referential index interpretation, as in Farkas (1997a). (See also Reinhart 1997 and Winter 1997 for alternatives.) (ii) The association of mountains to students that the dependent absolute reading requires is a pragmatic matter, just like in the case of dependent definite noun phrases, i.e., the function that associates mountains to students or cookies to kids is contextually established. That this is so is also shown in (49), where the association of students and essays needed for the dependent absolute reading to arise is provided by the context. Note also that, as expected given what is known about narrow scope, the variable the superlative depends on need not be its clause-mate:

(49) The students were required to write three essays each.
Every student thought that the teacher praised the longest essay.

Here the superlative noun phrase *the longest essay* may be given a dependent absolute interpretation, under which every student x thought that the teacher praised the longest of the three essays x wrote. (iv) Finally, we note that superlative noun phrases under the dependent absolute reading do not share any of the special properties that comparatives exhibit. For a superlative to be given a dependent absolute interpretation all that is required is for the context to provide the required association, for there to be an appropriate variable for the superlative to co-vary with, and for the descriptive content of the superlative noun phrase to be compatible with further restrictions.

3.4. *Comparative Superlatives*

We approach the intuitive characterization of the comparative reading of superlative noun phrases by contrasting them with dependent absolute superlatives. The characteristic the two readings share is that they rely on an association of elements of some set X with sets of entities. Thus, in (49) the dependent reading arose only because of the presence of an association of students with sets of essays they wrote. Similarly, we claim, the comparative reading of the superlatives in our earlier examples, repeated here as (50),

(50)a. Who climbed the highest mountain?

b. JOHN climbed the highest mountain.

c. I know the man who climbed the highest mountain.

necessarily involves the association of each individual c in the set C over which the licensing operator ranges with sets of mountains climbed by c.

We turn now to the differences between comparatives and dependent absolute superlatives. First, note that while in the case of the latter the association just mentioned is pragmatically determined, in the case of the former it necessarily involves the predicate of the sentence. Thus, in a context where it has been established that every individual c in the relevant set C has photographed some set of mountains, (50b) *cannot* be interpreted as saying that John climbed a mountain that was higher than any mountain *photographed* by any other individual in C.[11] In the same context, however, (51)

(51) Everyone climbed the highest mountain.

[11] We are grateful to an anonymous reviewer for bringing this point to our attention.

can be given a dependent reading under which the sentence claims that every individual c in C climbed the highest mountain among the mountains c photographed. This contrast shows that the property on the basis of which the relevant association is done is contextually provided in the case of dependent absolute superlatives, just as with other dependent definites. In the case of comparative superlatives, however, the property in question is necessarily given by the predicate of which the superlative noun phrase is an argument.

Second, recall that under the dependent absolute reading the superlative is evaluated relative to the variable it depends on. Thus, the reference of *the highest mountain* in the relevant reading of (51) co-varies with the climbers. This type of co-variation is not present in the comparative reading of (50). Finally, recall that under the dependent absolute reading, when the superlative is evaluated relative to some value c of the variable bound by the universal, the field of comparison is made up only of elements associated with c. This means that if the r-argument is chosen from the set of essays associated to John, the s-arguments are also chosen from this set. Under the comparative superlative reading on the other hand, matters are more complex. In our example (50b) for instance, the r-argument is a mountain climbed by John; the s-argument on the other hand must range over mountains climbed by individuals in C other than John.

According to our proposal, the difference between the comparative and the absolute reading of superlatives is a matter of how the s-values are chosen. We differ from Heim in that for us both readings of the superlative noun phrases in (50) involve comparing mountains relative to height. The difference consists in the fact that under the comparative reading one compares the height of a mountain climbed by one climber with the height of mountains climbed by other climbers. This means that the mountains in the field of comparison are differentiated by the individuals in C that climbed them. The ingredients necessary for the comparative reading of the superlative in our examples in (50) are the following: (i) a set C of individuals over which the licensing variable ranges; (ii) a function, f_{climb} that assigns to each individual c in C a set of mountains that c climbed. The crucial aspect of the comparative reading is that it involves a function f whose domain is the set over which the licensing variable ranges. In our example, the mountains that serve as values for the r- and s-arguments in the comparative superlative reading are chosen from sets of mountains in the range of f_{climb}; they are mountains individuated by the climber who climbed them: when varying the value of the s-argument, one has to ensure that one varies the value of the variable that ranges over C.

Formally, this can be achieved by assuming that under the comparative superlative reading, the N' constituent receives a functional interpretation.[12] Following the notation in Chierchia (1993), the head noun in the comparative reading is doubly indexed in the syntax, as in (52), where i is syntactically bound by the constituent associated with the licensing variable, in our case *John*:

(52) [the [highest [mountain$^{i}_{y}$]]]

The superscript variable i will be referred to as the *correlate variable*, and its value is the correlate of the superlative. The function involved in the interpretation of the N' constituent is established on the basis of the predicate the superlative is an argument of, in our case *climb*$'$, whose domain is the set from which the values of the correlate variable are chosen. The interpretation of the N' constituent in (52) is given in (53), where $f_{climb}(i)$ is the set of entities climbed by i:

(53) $\lambda y(\textit{mountain}'(y) \wedge y \in f_{climb}(i))$

The interpretation of the superlative phrase *highest mountain* under the comparative reading is given in (54):

(54) $\lambda y\,(\textit{mountain}'(y) \wedge y \in f_{climb}(i) \wedge \forall j \forall y'[(\textit{mountain}'(y') \wedge y' \in f(j) \wedge j \neq i) \rightarrow \textit{high}'(y) > \textit{high}'(y')])$

To ensure the proper selection of values for the s-argument, y', the identity condition must be given in terms of the correlate variable in case the values of the r- and s-arguments are determined on the basis of a function.[13] Note that the problem mentioned in footnote 6 does not arise under the current analysis: the referent of the superlative (the r-argument) must exceed in

[12] See Chierchia (1992) for a functional treatment of E-type pronouns and Chierchia (1995) for an extensive use of functional interpretations for definite noun phrases. For the use of functional interpretations in questions, see Groenendijk and Stokhof (1984) and Engdahl (1986).

[13] The absolute and the comparative reading of superlatives may be collapsed by assuming that the absolute reading involves an identity function f from mountains to mountains. In this case the subscript and superscript variables on the N' would be identical. The identity condition would always involve the correlate variable. Just like in Heim (1985), the problem that arises is why the absolute superlative does not have to be focused, since under the absolute reading it serves as its own correlate, and the correlate in comparative superlatives must be focused.

height all mountains climbed by climbers other than the referent of the correlate. The interpretation of the whole DP under the comparative reading is given in (55):

(55) $\iota y\,(\mathit{mountain}'(y) \wedge y \in f_{climb}(i) \wedge \forall j \forall y'[(\mathit{mountain}'(y') \wedge y' \in f(j) \wedge j \neq i) \rightarrow \mathit{high}'(y) > \mathit{high}'(y')])$

Under the current analysis, the difference between the absolute and the comparative reading of superlatives concerns the way in which the N' constituent is interpreted. Under the absolute reading, the semantics of N' is determined solely by its surface constituents. Under the comparative reading, on the other hand, the interpretation of N' involves the predicate the superlative DP is an argument of, as well as one of the co-arguments of the superlative DP, which provides the correlate index. Our analysis, then, just like its predecessors, treats the absolute/comparative ambiguity as a matter of semantic scope of the superlative morpheme: in the comparative reading, the licensing variable and the predicate occur as part of the interpretation of N', and therefore are within the argument of *-est*, while under the absolute reading this is not so. We differ from previous work in that we capture this semantic scope difference without having recourse to syntactic movement and accompanying changes in interpretation. Note that this case differs from ordinary scope ambiguity instances in that here simply moving the superlative morpheme to a position c-commanding the licensing variable and the predicate does not automatically yield a structure whose interpretation is the one needed, and therefore a movement analysis is less compelling for this case than for cases involving quantifier scope.

Going back to the contrast between comparative and dependent absolute superlatives, note that what they share is that in both cases the field of comparison is subject to an implicit restriction. The difference is that for dependent absolute superlatives this restriction is pragmatic, while in the case of the comparative superlative, the restriction affects the semantic interpretation of the N' constituent. This approach correctly predicts that when the overt content of an N' is incompatible with further implicit restrictions, as in the case of noun phrases such as *the highest mountain in the US* and others mentioned in (44), the comparative interpretation will not be available. This prediction is confirmed by the unambiguous status of the examples in (56), which can only be given an absolute interpretation:

(56)a. JOHN climbed the highest mountain in the US.

b. Who climbed the highest mountain in the US?

The analysis of the comparative reading proposed above rests on allowing the semantic interpretation of the N′ constituent in a superlative noun phrase to be affected by the predicate and one of the co-arguments of the noun phrase in question. In order for this to be possible, semantic interpretation has to be allowed the freedom expressed in (57).

(57) The interpretation of an argument x may be affected by the predicate x is an argument of, as well as by the co-arguments of x.

Note that the license accorded by (57) is needed for cases that are independent of comparatives. Thus, semantic dependencies involving temporal and subject reference are needed involving a predicate and its sentential complement in an account of the semantics of complementation. These dependencies are also restricted to minimal predicate-argument complexes; there are no predicates that directly affect the modal or temporal interpretation of clauses that are arguments of other predicates.

Finally, note that given what was said above, it should be possible to have the predicate restrict the field of comparison of a superlative DP in the absence of a correlate index, i.e., in absolute superlatives as well. Example (58a) under its most natural interpretation, given in (58b), shows that this prediction is correct.

(58)a. The first man landed on the moon in 1969.

b. The first man who landed on the moon, landed on the moon in 1969.

As expected, this restriction is local, and thus (59a) lacks the reading paraphrased in (59b):

(59)a. The first man remembered that he landed on the moon in 1969.

b. *The first man who landed on the moon remembered that he landed on the moon in 1969.

The restriction on the field of comparison exemplified here and in comparative superlatives is semantic rather than pragmatic in that it affects the semantic interpretation of the N′ constituent.[14] The above observations

[14] See Chierchia's (1992) analysis of E-type pronouns, where it is argued that the range variable is syntactically, rather than contextually fixed.

lead to the conclusion that one has to recognize two types of implicit restrictions: semantic and pragmatic. The former are predicted to be subject to locality conditions while the latter are not. We have just seen two examples of local semantic restrictions. Cases usually treated in the literature as global presupposition accommodation are examples of non-local, pragmatic implicit restrictions. Their non-local nature is shown by (60a), which can be interpreted as (60b):

(60)a. Every man thought that his wife had taken the car.

b. Every man who had a wife thought that his wife had taken the car.

We turn now to an important consequence of our analysis, namely the prediction that if a comparative superlative has a referent, its correlate will be unique. To go back to our mountain and climber examples, if the noun phrase *the highest mountain* under its comparative interpretation has a referent, say m_1, and its correlate is John, no other climber in the relevant set of climbers has climbed m_1. To exemplify, consider a scenario where the set of all mountains in the model and their ordering by height is given in (61a), the set of climbers is as in (61b) and f_{climb}, is defined as in (61c).

(61)a. $M = m_1, m_2, m_3, m_4, m_5$
$m_1 > m_2 > m_3 > m_4 > m_5$

b. $C = \{a, p, s\}$

c. $f_{climb}(a) = \{m_1, m_2\}$; $f_{climb}(p) = \{m_2, m_3\}$; $f_{climb}(s) = \{m_2, m_4\}$

Under these conditions, the referent of the superlative noun phrase *the highest mountain* under its comparative interpretation of our example is m_1, and its correlate is a. This is so because if m_1 is the value given to y and a is the value given to the correlate variable i, for any climber c other than a, and any mountain m that c climbed, the height of m_1 exceeds that of m. Consider now a scenario as above, except f_{climb} is as in (62).

(62) $f_{climb}(a) = \{m_1, m_2\}$; $f_{climb}(p) = \{m_1, m_3\}$; $f_{climb}(s) = \{m_2, m_4\}$

Under the conditions in (62), the superlative fails to refer because both *a* and *p* have climbed m_1 and therefore neither *p* nor *a* are appropriate correlate values.[15]

Under our proposal, if the superlative noun phrase has a referent, its correlate is unique. This property plays an important role in accounting for the special characteristics of comparative superlatives noted in section 2. In fact, it is in order to capture this property that the analysis given above is to be preferred over a simpler account where the field of comparison in the comparative reading would simply be the set of mountains M such that for each $m \in$ M there is some $c \in$ C such that *c* climbed *m*, where C is a set of contextually established climbers. Under such an account the correlate would not necessarily be unique, and thus one would make the incorrect prediction that the superlative refers to m_1 under the scenario in (62). The simplest version of this analysis is one where the field of comparison is a contextually provided set of mountains such that each mountain was climbed by some individual in another contextually given set C. This account, which we dub the contextually salient view, would incorrectly predict that the superlatives in (63b,c) may have a comparative reading in the context of (63a):

(63)a. The students in our class climbed some mountains last week.

b. The highest mountain had snow on its peak.

c. John was among those who climbed the highest mountain.

Under the most salient interpretation of (63b,c) in the context of (63a), the field of comparison is made up of the subset of mountains made salient by (63a), namely the mountains that were climbed by the students in our class last week. Under the contextually salient view the superlatives in (63b,c) would be indistinguishable from comparative superlatives, an unfortunate result. Requiring the restriction to be part of the interpretation of the superlative noun phrase takes us closer to the analysis we propose but would

[15] In order to account for the fact that plural or coordinate noun phrases may serve as correlates one has to allow the correlate to range over non-atomic parts of C. Note also that if this scenario is modified so that neither *s* nor *p* climbed m_2, our analysis predicts that the comparative superlative *the highest mountain* will fail to refer, because the argument of the iota-operator is not a singleton set. Exactly the same problem arises with an absolute superlative whose field of comparison is M in (61a). Changing the noun phrase to *the highest mountains* solves the problem. We find no contrast between the absolute and the comparative readings in this case. The intuitions are subtle since in both cases the uniqueness condition can be met by disregarding m_1 or m_2.

still not give us the uniqueness of the correlate. The analyses just sketched share with the analysis we propose the fact that they assume that under both absolute and comparative interpretations of our superlative noun phrase one compares mountains with respect to height. Semantically then, the superlative morpheme combines with the interpretation of the adjective under both readings. Note also that under our proposal, the truth of (50b) under the comparative reading of the superlative entails the truth of the same sentence under an absolute reading where the field of comparison is contextually restricted to mountains climbed by climbers in C. This is so because if the sentence is true under the comparative reading, the mountain referred to by the superlative DP must be the highest mountain in the set of mountains climbed by the elements of C.

Recall now that the correlate is unique in the analysis in Heim (1985) as well. Under Heim's analysis, the correlate is unique because it is the value of the r-argument. For Heim, in the comparative interpretation of (50b) the field of comparison is C, the climbers. Under this analysis, the comparative reading differs from its absolute counterpart both with respect to the field of comparison and with respect to the dimension along which the comparison is made. This radical difference is correlated with radical differences at LF.

To sum up now, under the analysis proposed here a superlative has a comparative reading only if the superlative noun phrase has a co-argument that can serve as correlate index. This means that the argument in question ranges over a set of entities and is bound by an operator whose semantics is compatible with the uniqueness condition on the correlate imposed by the semantics of the superlative. We turn now to showing what this view predicts concerning the properties of comparative superlatives discussed in section 2.

4. Properties of the Comparative Superlative Revisited

4.1. *Licensing*

Subsection 2.1 established the generalization in (13), according to which a superlative noun phrase may get a comparative reading only in the presence of an operator whose argument is a contextually provided finite set and whose semantics is compatible with its value being a unique element of that set. Under the present analysis this condition follows from the fact that the comparative reading relies on the presence of a correlate variable. The correlate variable must range over a contextually provided set, and in order for the comparative noun phrase to have a referent, the value of the

correlate argument must be the unique element of that set that possesses the property ascribed by the predicate of the sentence.

Note now that a variable bound by a *wh*-operator in a question may play the role of a licensing variable just in case the existence presupposition associated to the variable bound by the wh-operator is left intact. We thus predict that superlatives in questions with suspenders, such as in (10), repeated here as (64) will only be interpreted as absolute superlatives:

(64) Who, if anybody, climbed the highest mountain?

In *wh*-questions the variable bound by the *wh*-operator is the licensing variable and therefore the variable that gives the domain of the function involved in the interpretation of the superlative. The comparative reading of a superlative in a *when* or *why* question is not possible because in their case the *wh*-variable is not an argument of the predicate and therefore it cannot function as the correlate of the superlative. Note also that since the value of the correlate must be unique in our account, *wh*-questions license the comparative reading under the uncontroversial assumption that their semantics is compatible with the value of the *wh*-variable being unique.[16]

Note now that the contrast in (9), repeated here as (65), follows from the proposed analysis, under the assumption that the use of the indefinite article in (65c) clashes with the uniqueness condition on the correlate:

(65)a. I know the man who climbed the highest mountain.

b. I know a man who climbed the highest mountain.

c. I know a man who climbed the most mountains.

Having the licensing variable bound by *every*, *several*, *many* or *most* is also incompatible with the uniqueness condition, and therefore we explain why the superlative in (66) may only have an absolute interpretation:

(66) Every/several/most students climbed the highest mountain.

The uniqueness condition on the correlate is also responsible for the unacceptability of (67) under a comparative interpretation of the superlative:

(67) Only John climbed the highest mountain.

[16] See Rullmann (1995) and Dayal (1996) for proposals where *wh*-questions are argued to involve uniqueness.

The problem here is that the presupposition contributed by *only* conflicts with the uniqueness presupposition of the correlate.[17] As argued for in the literature since Horn (1972b), a sentence of the form (68),

(68) Only John VPed.

asserts that no individual other than John in the alternative set VPed. Given felicity conditions on assertion, it follows that at the point when (68) is added to the discourse, the discourse should be compatible with the claim that individuals other than John VPed. In other words, (68) presupposes that it is possible for individuals in the alternative set other than those in the scope of *only* to have VPed. This presupposition is in conflict with the uniqueness presupposition of the correlate.

Finally, note that the conditions required by the comparative reading to arise are met when the correlate is a focused constituent. Following Krifka (1991), we assume that sentences involving a focused constituent place the following requirements on their contexts: (i) there must be a set X, the alternative set, which the focused argument is an element of, and furthermore, it must be the case that for every $x \in$ X it could in principle be the case that P(x) = 1, where P is the propositional function arrived at by abstracting over the focused argument; (iii) it must be assumed that there is some $x \in$ X that makes P true. The interpretation of the focused argument is that element x' in X such that P(x') is indeed true. Furthermore, following É Kiss (1998) there is a further uniqueness condition according to which x' is also the only element of X that renders the assertion true.

Note now that these requirements fit those of a sentence involving a comparative superlative when the focused constituent is taken to be the correlate. The correlate index is the variable ranging over the alternative set, and the focused constituent meets the existence and uniqueness conditions on correlates. We thus predict that an ordinary noun phrase such as *John* may serve as correlate only if focused. The connection between focus and the comparative reading discussed in section 2 is thus accounted for.

The acceptability of the comparative reading in examples where the licensing variable is an indefinite which, however, is focused follows from the semantics of focus, which requires a sentence such as (69)

(69) A PROFESSOR was paid the least amount of money.

to be interpreted as having in the alternative set various ranks, and asserting that the professor rank is the only one in this set of which *x was paid the least amount of money* is true.

[17] We are grateful to an anonymous reviewer for suggesting this analysis.

Under the present account, then, the fact that the comparative reading arises only in the presence of a licensing operator-variable chain of the appropriate type follows from the semantics of the comparative superlative reading, which requires the presence of an appropriate correlate variable. The presupposition of uniqueness of the correlate associated with the comparative reading is responsible for the semantic constraints on the type of operator that can bind this variable.

4.2. *Locality and Primacy*

Recall that in section 2.2 it was established that the comparative superlative and the licensing variable obey a Locality Condition that requires them to be in the same local domain, with no barrier intervening between them, and, moreover, that they are also subject to a Primacy Condition that requires the licenser to m-command the superlative. We review here the features of our analysis that can be exploited to predict the existence of these constraints.

In our analysis, in the comparative reading the variable y associated to the superlative is indexed by the licensing variable i, the correlate, and the predicate i and y are arguments of is involved in determining the field of comparison. Because of the way these variables interact, they are mutually dependent in the sense that an element is in the set over which i ranges only if there is a y appropriately related to it, and, on the other hand, the set over which y ranges is made up only of that subset of the denotation of the overt material in N′ that furnishes the range of the function in question. In our examples, i ranges only over individuals who climbed some mountain, and the field of comparison is made up only of mountains that were climbed by some individual in the relevant set. We suggest that it is this mutual dependency that is responsible for the Locality Condition. More specifically, we suggest that underlying this condition is the requirement that the two variables be co-arguments. We connect this requirement to constraints on quantifier scope. It has been argued in the literature that a quantifier may scope only over its co-arguments or over arguments contained in its coarguments. Thus, *every* may scope over the indefinite in (70a,b) but not in (70c):

(70)a. Every doctor examined a patient.

b. A doctor examined every patient.

c. A doctor thought that every patient was in serious condition.

When the indefinite is within the scope of the universal it is referentially dependent on it in the sense that the values assigned to the variable contributed by the indefinite co-vary with those assigned to the variable bound by the universal. The scope facts in (70) are accounted for if one assumes the constraint in (71),

(71) A variable *y* may be dependent on a variable *x* only if *x* is accessible to *y*.

where accessibility is defined as in (72).

(72) A variable *x* is accessible to a variable *y* iff *x* and *y* are co-arguments or if *y* is contained within a co-argument of *x*.

Requiring the superlative and the licensing variable to be mutually accessible amounts to requiring them to be co-arguments. This requirement is connected to the fact that the correlate and the predicate appear in the semantic interpretation of the N′ under the comparative reading, as an implicit semantic restriction. The freedom of such restrictions is subject to the co-argument constraint in (57) above.

In order to account for cases in which the correlate argument is in a matrix clause and the superlative is in an infinitival clause, as in (73)

(73) JOHN wanted to climb the highest mountain.

we assume that, under certain conditions, the matrix and the infinitival predicate form a complex predicate, which then appears in the interpretation of the N′ argument of the superlative. The discussion of infinitival constructions in section 2 suggests that complex predicate formation correlates in syntax with CP deletion. In fact, Brody (1997) argues that in CP-deletion structures the infinitival phrase has no subject position, i.e., that both Raising and ECM constructions involve a complex predicate phrase consisting of two stacked predicate phrases without an intervening subject.

Note that CP-deletion, when viewed within the Computational System of language, is an *ad hoc* feature of certain predicates, encoded as a lexical property. Thus, the fact that CP-deletion only affects certain types of classes of semantically ‘light’ verbs whose complements show semantic dependencies of various sorts relative to the matrix is an accidental fact. Under our assumptions, on the other hand, CP-deletion is the syntactic reflection of the semantic process of complex predicate formation, which entails that the matrix and the embedded predicate to be merged will have dependent semantic parameters.

The existence of the Primacy Condition points to an asymmetry in the relation between the two arguments. We connect this asymmetry to the fact that the licensing variable and the predicate the two arguments are arguments of appear in the semantic interpretation of the superlative noun phrase. We also note that the referent of the superlative noun phrase can only be established based on the domain of the licensing operator, whereas the domain of the operator is independent of the referent of the superlative. The required structural primacy of the licenser over the superlative noun phrase can thus be seen as the syntactic expression of this type of referential dependency. Dependent scope readings are subject to the Primacy Condition because they involve a similar type of referential dependency, with the values of the variable bound by the narrow scope operator depending on the values of the variable bound by the wide scope operator. In the present analysis, then, the existence of the Locality and Primacy Conditions arises as a result of the complex semantic relations between the superlative noun phrase and the licensing variable in the comparative reading.

4.3. *Specificity*

The Non-Specificity Effect generalization of section 2.3 summarizes the observation that comparative and absolute superlatives contrast in that the former but not the latter pattern with non-specifics. We turn now to the question of what explains this contrast under the analysis proposed here.

We suggest that the relevant notion of specificity involves a parameter of (in)dependence of reference that interacts with the uniqueness parameter definiteness is sensitive to. The uniqueness parameter, which involves the definite/indefinite divide, concerns the question of whether the value assigned to the variable associated with the DP is contextually fixed to a unique value or not. The (in)dependence parameter concerns the question of whether the reference of the variable associated with the DP co-varies or not with values assigned to some other variable. DPs with dependent reference co-vary with the variable they depend on, while DPs with independent reference are evaluated independently of values assigned to other variables. The referent of dependent definite noun phrases is unique relative to each value of the variable the noun phrase depends on, i.e., the choice of referent in their case is fixed relative to the context and relative to the value of the variable they depend on. With respect to the phenomena discussed in section 2.3 such noun phrases count as definite/specific, as shown by the acceptability of (74).

(74) *Every man thought that there was his hat on the table.

Here *his hat* is a definite noun phrase which co-varies with the values assigned to the matrix subject. The referent of dependent absolute superlatives co-varies with the values assigned to the variable it depends on but, just like with dependent definites, their referent is unique relative to every value assigned to that variable. Thus, the referent of dependent absolute superlatives, just like that of dependent definites, is unique relative to context and to the value of the variable they depend on. In the case of our previous example (48), repeated here as (75),

(75) Every student climbed the highest mountain.

once one has chosen a value for the universally quantified variable, the choice of referent for the superlative is unique. Dependent absolute superlatives pattern with other dependent definites.

Thus, absolute comparatives, just like ordinary definite noun phrases, have unique reference relative to a contextually established set. The case of comparative superlatives is special in that the uniqueness condition which is responsible for their being definite is sensitive to the whole range of the licensing variable. Establishing the referent of absolute superlatives is a matter of comparing elements of a contextually provided set with respect to a particular dimension. Establishing the referent of a comparative superlative crucially depends on the function involved in their interpretation. Recall that in the case of comparative superlatives, establishing their referent is not simply a matter of comparing elements of a set with respect to a particular dimension but, rather, it involves considering the range of the function involved in their interpretation for every element of its domain. Thus, in our standard example, the referent of *the highest mountain* under the comparative reading is established relative to the function f_{climb} and not relative to a contextually established set of mountains. What mountain it refers to depends not only on what mountains John climbed but also on what mountains the other climbers climbed. Under the proposed analysis, what sets comparative superlatives apart from absolute superlatives and other definite noun phrases is the special way their referent is established. The fact that absolute superlatives pattern with ordinary definites in certain respects, while comparative superlatives do not, is a consequence of their different semantics.

5. CONCLUSION

We have proposed here an analysis of comparative superlatives under which they are semantically more complex than their absolute counterparts

and have connected their special properties to this semantic complexity. In our approach, the ambiguity of superlatives is a matter of the semantic scope of the superlative morpheme, just like in previous work, but we differ in that for us, this scope ambiguity is not the result of LF movement. In this respect, the present paper is within the recent tradition of works that attempt to capture semantic scope effects without recourse to syntactic movement. In the account we propose, the properties of the comparative superlatives are semantically driven, and therefore they can be associated with an uneventful syntax, compatible with both the Minimalist Program and with frameworks that do away with syntactic movement altogether, such as LFG and HPSG. We have argued here that in the case of superlatives such an analysis is not only possible but also desirable, given that it is more successful than previous proposals in accounting for the contrasts between absolute and comparative superlatives. An important issue that we leave open at present is the question of how this analysis of superlatives fits into a broader picture of a theory of comparatives, and whether the approach can be successfully extended to other ambiguities within the realm of comparatives. Settling this question goes beyond the scope of this paper.

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