The Ambiguity of Comparatives with *Less*

Hotze Rullmann
University of Groningen

1. Introduction

Comparatives with *less* exhibit an ambiguity which, as far as I know, was first pointed out by Seuren (1979). (1) for instance can be interpreted as either (2) or (3):

(1)   The helicopter was flying less high than a plane can fly.
(2)   The helicopter was flying at an altitude below the **maximal** altitude at which a plane can fly.
(3)   The helicopter was flying at an altitude below the **minimal** altitude at which a plane can fly.

The reading paraphrased in (2) will be referred to as the maximum reading and the one paraphrased in (3) as the minimum reading. Note that the minimum reading entails the maximum reading, but not the other way around. Alternative ways of paraphrasing the two readings are given in (4) and (5), respectively.

(4)   A plane can fly higher than the helicopter was flying.
(5)   A plane can't fly as low as the helicopter was flying.

In a particular discourse context either the maximum or the minimum reading may be preferred. (6) is a context which favors the maximum reading, whereas (7) brings out the minimum reading.

(6)   Because the helicopter was flying less high than a plane can fly, the jet fighter could easily fire at it from above.
(7)   The jet fighter was trying to chase the helicopter, but because the helicopter was flying less high than a plane can fly, the jet fighter crashed into a building.

Another example which exhibits the same ambiguity as (1) is (8).

(8)   Lucinda was driving less fast than is allowed on this highway.

Only on the minimum reading does (8) imply that Lucinda was breaking the law. The ambiguity of (1) is preserved if we replace *less high* with *lower*:

(9)   The helicopter was flying lower than a plane can fly.

However, the comparative with *higher than* is not ambiguous. (10) can have the

maximum reading given in (11), but not the minimum reading in (12):

(10)   The helicopter was flying higher than a plane can fly.
(11)   The helicopter was flying at an altitude above the **maximal** altitude at which a plane can fly.
(12)   The helicopter was flying at an altitude above the **minimal** altitude at which a plane can fly.

This shows there is an asymmetry between unmarked or `positive' adjectives like *high* and their marked or `negative' antonyms like *low*. In this paper I will focus on ambiguities involving comparatives with *less*, but what I say about comparatives of the type *less high than* will presumably also apply to those of the type *lower than*. Because of space restrictions I won't address the question what consequences my analysis might have for our understanding of the asymmetry between marked and unmarked antonyms.

A standard result in the literature on the semantics of comparatives is that comparatives are downward entailing in the sense of Ladusaw (1979) and that they can therefore license negative polarity items. I will show that this is not true for the maximum reading of comparatives with *less*, although it is true for the minimum reading. My starting point will be von Stechow's semantics for comparatives according to which comparative clauses refer to maximal degrees. At the end of the paper I will discuss the question why comparatives with *less* often do not appear to be ambiguous at all, arguing that this is due to pragmatics.

2. Maximality in the semantics of comparatives

Following much of the literature (e.g. Cresswell (1976), Hoeksema (1983), von Stechow (1984)), I will assume that the semantics of comparatives involves reference to degrees. A sentence like (13a) can be analyzed as saying that Charles stands in the relation `tall' to the degree denoted by the measure phrase *six feet* (see (13b)). The positive form of the adjective without a measure phrase, as in (14a), may then be analyzed along the lines of (14b): Charles is tall to a degree d that is at least as great as some contextually determined standard s.

(13)   a.   Charles is six feet tall.
        b.   tall(c,6ft)
(14)   a.   Charles is tall.
        b. $\exists d[\text{tall}(c,d) \land d \geq s]$

I will assume that (13b) is true iff Charles is exactly six feet tall (rather than at least six feet tall), an assumption which is crucial for the semantics of comparatives with *less* to be given below.

We can now analyze the comparative in (15a) as (15b).

(15)   a.   Charles is taller than six feet.
        b. $\exists d[\text{tall}(c,d) \land d > 6\text{ft}]$

(16a), where the complement of *than* is a clause rather than a measure phrase, can be given a semantics that is completely parallel to (15b) if we assume that the comparative clause *Stanley is* also denotes a degree, namely the degree of Stanley's height. This is spelled out in (16b) with the help of the iota-operator ι. (16a) is true iff Charles is tall to degree d which is greater than the unique degree d' such that Stanley is d'-tall.

(16)   a.   Charles is taller than Stanley is.
        b. $\exists d[\text{tall}(c,d) \wedge d > \iota d'[\text{tall}(s,d')]]$

As von Stechow (1984) has argued, using the iota operator in this way is not going to work in cases where the comparative clause does not determine a unique degree. This will be the case whenever the comparative clause contains an indefinite NP or a modal verb with existential force such as *can* or *be allowed to*.[1] (17a) is a case in point. If Stanley can jump six feet high, then he can also jump five feet high or four feet high, etc, so there is no unique degree d' such that Stanley can jump d'-high. To solve this problem, I will follow von Stechow in introducing an operator *max*, defined in (18), which picks out the maximal degree from a set of degrees. *max* is defined relative to a strict linear order, which in this case is the relation $>$ (`greater than') as defined on degrees. The interpretation of (17a) can then be represented as in (17c), rather than (17b).

(17)   a.   Charles jumped higher than Stanley can (jump).
        b. $\exists d[\text{Charles jumped } d\text{-high} \wedge d > \iota d'[\text{Stanley can jump } d'\text{-high}]]$
        c. $\exists d[\text{Charles jumped } d\text{-high} \wedge d > max_>(\lambda d'[\text{Stanley can jump } d'\text{-high}])]$.

(18)   Let D be a set and R a strict linear order on D.
        $max_R(D) =_{\text{def}} \iota d[d \in D \wedge \forall d' \in D[R(d,d') \vee d=d']]$

As will be shown in the next section, von Stechow's semantics for comparatives in terms of maximality can account for an important property of comparatives, namely their ability to license negative polarity items.

3. Comparatives and negative polarity licensing

It is well known that negative polarity items (NPI's) can occur in the complement of a comparative (see for instance Ladusaw (1979), Hoeksema (1983), von Stechow (1984)).

(19)   a.   Susan is taller than *any* of her friends.
        b.   Charles jumped higher than *anybody* had expected.
        c.   The plane was flying higher than a helicopter *ever* could.

Ladusaw (1979) shows that in order for an NPI to be licensed it has to occur in the scope of a downward entailing function. A downward entailing function is a

function which reverses inclusion relations, in contrast to an upward entailing function which preserves them. The formal definitions are given in (20).

(20)   A function *f* is *upward entailing* iff
       for all X,Y in the domain of *f*: if X $\subseteq$ Y, then f(X) $\subseteq$ f(Y).
       A function *f* is *downward entailing* iff
       for all X,Y in the domain of *f*: if X $\subseteq$ Y, then f(Y) $\subseteq$ f(X).

To account for the ability of comparatives to license NPI's we have to demonstrate that the comparative construction is downward entailing. (21) shows that in the context of a comparative we can replace a term denoting a certain set (*kangaroo*) by a term denoting a subset of that set (*male kangaroo*), which means that the comparative is indeed downward entailing.

(21)   Charles jumped higher than a kangaroo can jump $\Rightarrow$
       Charles jumped higher than a male kangaroo can jump

       In terms of the semantics for comparatives sketched in the preceding section, we have to show that the implication in (22) holds. It is not hard to see that this will be the case. Since the set of male kangaroos is a subset of the set of kangaroos, the maximal height that an (arbitrary) kangaroo can jump will be equal to or greater than the maximal height that a male kangaroo can jump, that is, $max_>(\lambda d'$[a kangaroo can jump d'-high]) $\geq max_>(\lambda d'$[a male kangaroo can jump d'-high]).

(22) $\exists d$[Charles jumped d-high $\wedge$ $d > max_>(\lambda d'$[a kangaroo can jump d'-high])]
       $\Rightarrow$
       $\exists d$[Charles jumped d-high $\wedge$ $d > max_>(\lambda d'$[a male kangaroo can jump d'-high])]

In more general terms the downward entailing character of the comparative is captured by the result in (23), where D and D$'$ are sets of degrees and P is a relation between an entity and a degree.

(23)   If D$' \subseteq$ D, then
       $\{x \mid \exists d[P(x,d) \wedge d > max_>(D)]\} \subseteq \{x \mid \exists d[P(x,d) \wedge d > max_>(D')]\}$

4. A problem

       Having demonstrated the downward entailing character of comparatives like *taller than* and *higher than* we now turn to comparatives with *less*. The data in (24) show that comparatives with *less* also have the ability to license NPI's.

(24)   a.   Susan is less tall than *any* of her friends.
       b.   Charles jumped less high than *anybody* had expected.
       c.   The helicopter was flying less high than a plane *ever* could.

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On the basis of Ladusaw's theory this leads us to expect that comparatives with *less* are also downward entailing. Hendriks (1993), however, has argued that comparatives with *less* support upward rather than downward inferences, as shown in (25) and (26).

(25)   Charles jumped less high than a male kangaroo can jump ⇒
        Charles jumped less high than a kangaroo can jump.
(26)   Charles jumped less high than a kangaroo can jump ⇏
        Charles jumped less high than a male kangaroo can jump.

We are faced then with a problem. On the one hand comparatives with less appear to be upward entailing, while on the other hand they can license negative polarity items, and therefore should be downward entailing according to Ladusaw's theory. This might lead us to conclude that Ladusaw's theory is wrong. However, I want to argue that such a drastic conclusion is not warranted. One indication pointing in that direction is the fact that the ability of comparatives with *less* to license NPI's is not as clear-cut as the data in (24) seem to show. Precisely in the example I used to demonstrate the upward entailing character of comparatives with *less*, the occurrence of an NPI does not seem to be very acceptable, at least not in ordinary discourse contexts:

(27)   #Charles jumped less high than *any* kangaroo can jump.

I will return to the issue of the acceptability of this sentence in the last section.
        The solution to our problem lies in the ambiguity of comparatives with *less*. As I will show in the next section, one of the two readings distinguished in section 1 is upward entailing, whereas the other one is downward entailing.

5. The solution: Comparatives with *less* are (potentially) ambiguous

        In section 1, I showed that sentence (1), repeated here as (28), can have two readings, the maximum and the minimum reading.

(28)   The helicopter was flying less high than a plane can fly.

Using the maximality operator *max* defined above, the maximum reading can be represented as follows:

(29) $\exists d$[The helicopter was flying d-high $\wedge$ $d < max_>(\lambda d'$[a plane can fly d'-high])].

(29) says that the helicopter was flying at an altitude which was below the maximal altitude at which a plane can fly.
        Capturing the minimum reading of (28) is less straightforward. We could of course introduce an operator *min* which would select the minimal element from a set of degrees. However, such a move would be rather ad hoc, if only because

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it would leave us without an explanation for why a sentence like (10) cannot have the minimum reading (12). A more interesting approach is to think of the minimum reading as resulting from an inversion of the linear order among degrees. To get the minimum reading we take the maximum with respect to the relation $<$ rather than $>$. In the semantic representation this comes down to replacing $max_>$ with $max_<$, giving us (30) as the representation of the minimum reading:

(30) $\exists d$[The helicopter was flying d-high $\land$ $d < max_<(\lambda d'$[a plane can fly d'-high])].

We can think of comparative sentences like (28) and (10) as locating the altitude of the helicopter on a scale consisting of the altitudes at which it is possible for a plane to fly. In the *higher than* comparative (10), the altitude of the helicopter is located somewhere above the maximum point of the scale. The comparative with *less high than* can be interpreted in one of two ways. Either it can mean that the altitude of the helicopter is located somewhere below the maximum point on the scale (the maximum reading), or the scale is inverted altogether and the altitude of the helicopter is located somewhere below the maximum point on the inverted scale (the minimum reading). Of course the maximum point on the inverted scale is identical to the minimum point on the non-inverted scale.

Given this analysis of the maximum and the minimum reading, we can now investigate the monotonicity behavior of comparatives with *less* on both readings. If comparatives with *less* are upward entailing (on a given reading) the implication in (31) should be valid; if they are downward entailing, however, the implication (32) should hold.

(31)   The helicopter was flying less high than a propeller plane can fly $\Rightarrow$
        The helicopter was flying less high than a plane can fly.
(32)   The helicopter was flying less high than a plane can fly $\Rightarrow$
        The helicopter was flying less high than a propeller plane can fly.

I turns out that on the maximum reading comparatives with *less* are upward entailing, whereas on the minimum reading they are downward entailing.

Let's first take the maximum reading. An informal paraphrase of (31) on the maximum reading already makes clear that the maximum reading is upward entailing.

(33)   The helicopter was flying below the maximal altitude at which a propeller plane can fly $\Rightarrow$
        The helicopter was flying below the maximal altitude at which a plane can fly.

In terms of the semantics for the maximum reading given above, we have to show that the following implication is valid.

(34) $\exists d$[The helicopter was flying d-high $\wedge$ $d < max_{>}(\lambda d'$[a propeller plane can fly d'-high])] $\Rightarrow$
        $\exists d$[The helicopter was flying d-high $\wedge$ $d < max_{>}(\lambda d'$[a plane can fly d'-high])]

It is not hard to see that this will indeed be the case. Since the set of propeller planes is a subset of the set of planes, the maximal altitude at which an (arbitrary) plane can fly is guaranteed to be greater than or equal to the maximal altitude at which a propeller plane can fly (that is, $max_{>}(\lambda d'$[a plane can fly d'-high]) $\geq$ $max_{>}(\lambda d'$[a propeller plane can fly d'-high])). Therefore, if the helicopter's altitude was below the maximal altitude at which a propeller plane can fly, it certainly was below the maximal altitude at which an (arbitrary) plane can fly.
        More generally, the following holds:

(35)   If D$'$ $\subseteq$ D, then
        $\{x \mid \exists d[P(x,d) \wedge d < max_{>}(D')]\} \subseteq \{x \mid \exists d[P(x,d) \wedge d < max_{>}(D)]\}$

        Now let's turn to the minimum reading. The intuitive validity of (36) shows that the minimum reading is downward entailing:

(36)   The helicopter was flying below the minimal altitude at which a plane can fly $\Rightarrow$
        The helicopter was flying below the minimal altitude at which a propeller plane can fly.

This can be expressed more formally as in (37).

(37) $\exists d$[The helicopter was flying d-high $\wedge$ $d < max_{<}(\lambda d'$[a plane can fly d'-high])] $\Rightarrow$
        $\exists d$[The helicopter was flying d-high $\wedge$ $d < max_{<}(\lambda d'$[a propeller plane can fly d'-high])]

Because the set of propeller planes is a subset of the set of planes, it must be true that $max_{<}(\lambda d'$[a plane can fly d'-high]) $\leq$ $max_{<}(\lambda d'$[a propeller plane can fly d'-high]), that is, the minimal altitude at which an (arbitrary) plane can fly is less than or equal to the minimal altitude at which a propeller plane can fly. Therefore, if the helicopter was flying below the minimal altitude at which a plane can fly, it was also flying below the minimal altitude at which a propeller plane can fly.
        The fact that on the minimum reading comparatives with *less* are downward entailing is captured in (38):

(38)   If D$'$ $\subseteq$ D, then
        $\{x \mid \exists d[P(x,d) \wedge d < max_{<}(D)]\} \subseteq \{x \mid \exists d[P(x,d) \wedge d < max_{<}(D')]\}$

        My claim that only the minimum reading of comparatives with *less* is

downward entailing predicts that NPI's will only be licensed on that reading. This is borne out by (39). In contrast to the ambiguous (28), (39) can only have the minimum reading.

(39)   The helicopter was flying less high than *any* plane can *ever* fly.

Thus, rather than undermining it, comparatives with *less* confirm Ladusaw's theory in a very nice way.

6. Anti-additivity

Hoeksema (1983) and von Stechow (1984) show that in comparatives of the type *higher than* a disjunction inside the complement of *than* is equivalent to a matrix conjunction:

(40)   Charles jumped higher than a kangaroo or an antelope can jump ⇔
        Charles jumped higher than a kangaroo can jump and Charles jumped higher than an antelope can jump.

In mathematical terms, this means that the *higher than* comparative is anti-additive in the sense of Zwarts (1986), a property which he defines as follows:

(41)   A function *f* is *anti-additive* iff
        for all X,Y in the domain of *f*: $f(X \cup Y) = f(X) \cap f(Y)$.

Zwarts shows that the anti-additive functions are a proper subset of the downward entailing ones.
        The semantics for comparatives given in section 2 (i.e. essentially the semantics proposed by von Stechow), accounts for their anti-additivity, as can be seen from the fact that the equivalence in (42) holds:

(42) $\exists d$[Charles jumped *d*-high $\land$ $d > max_>(\lambda d'$[a kangaroo or an antelope can jump *d'*-high])] ⇔
        $\exists d$[Charles jumped *d*-high $\land$ $d > max_>(\lambda d'$[a kangaroo can jump *d'*-high])]
        and $\exists d$[Charles jumped *d*-high $\land$ $d > max_>(\lambda d'$[an antelope can jump *d'*-high])]

More generally, the following is true:

(43) $\{x \mid \exists d[P(x,d) \land d > max_>(D \cup D')]\} =$
        $\{x \mid \exists d[P(x,d) \land d > max_>(D)]\} \cap \{x \mid \exists d[P(x,d) \land d > max_>(D')]\}$

What about comparatives with *less*? Is the following equivalence valid, for instance?

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(44)   The helicopter was flying less high than a plane or a cruise missile can fly
         $\Leftarrow?\Rightarrow$
         The helicopter was flying less high than a plane can fly and the helicopter
         was flying less high than a cruise missile can fly.

Of course the answer will depend on whether we take the maximum or the
minimum reading. Above I have shown that the maximum reading is upward
entailing, which means that it cannot be downward entailing. Because the anti-
additive functions are a proper subset of the downward entailing functions, we may
conclude that on the maximum reading comparatives with *less* are not anti-additive.
         The minimum reading, however, is anti-additive. This can be seen from the
paraphrase of the minimum reading of (44) in (45), and also from the more formal
representation in (46):

(45)   The helicopter was flying below the minimal altitude at which a plane or a
         cruise missile can fly $\Leftrightarrow$
         The helicopter was flying below the minimal altitude at which a plane can
         fly and the helicopter was flying below the minimal altitude at which a
         cruise missile can fly.

(46) $\exists d$[The helicopter was flying d-high $\wedge$ $d < max_<(\lambda d'$[a plane or a cruise
         missile can fly d'-high])] $\Leftrightarrow$
         $\exists d$[The helicopter was flying d-high $\wedge$ $d < max_<(\lambda d'$[a plane can fly d'-
         high])] and $\exists d$[The helicopter was flying d-high $\wedge$ $d < max_<(\lambda d'$[a cruise
         missile can fly d'-high])].

This equivalence can be explained as follows. Suppose a cruise missile can fly
closer to the ground than a plane can. This means that the minimal altitude at which
a cruise missile can fly is less than or equal to the minimal altitude at which a plane
can fly, that is, $max_<(\lambda d'$[a cruise missile can fly d'-high]) $\leq max_<(\lambda d'$[a plane can
fly d'-high]). Therefore, $max_<(\lambda d'$[a plane or a cruise missile can fly d'-high]) $=$
$max_<(\lambda d'$[a cruise missile can fly d'-high]). From this it follows that (46) is valid.
         The anti-additivity of the minimum reading of comparatives with *less* is
expressed by the result in (47):

(47) $\{x \mid \exists d[P(x,d) \wedge d < max_<(D \cup D')]\} =$
         $\{x \mid \exists d[P(x,d) \wedge d < max_<(D)]\} \cap \{x \mid \exists d[P(x,d) \wedge d < max_<(D')]\}$

7. Why comparatives with *less* often do not appear to be ambiguous

         So far I have argued that comparatives with *less* are (at least potentially)
ambiguous and that the two readings have different logical properties. The
maximum reading is upward entailing, whereas the minimum reading is downward
entailing and anti-additive. NPI's are licensed on the minimum reading, but not on

the maximum reading. It should be noted that the examples I have used to demonstrate the ambiguity have been of a rather special kind. Many, if not most, comparatives with *less* do not appear to be ambiguous at all. After all, the ambiguity of comparatives with *less* has largely been overlooked in the literature on the semantics of comparatives. In this section I will briefly address the question why comparatives with *less* often are not actually ambiguous.

We have already seen that the presence of an NPI in the comparative clause is one reason why a comparative with *less* may fail to be ambiguous. Another, more important reason for the lack of ambiguity in many instances is that there may not be an element with existential force (an NP or a modal) inside the comparative clause, which means that the maximum and the minimum will be identical. In (48), for instance, there is only one degree d such that the plane was flying d-high. As a result the maximum and the minimum reading coincide in this case:

(48)   The helicopter was flying less high than the plane was flying.

Perhaps more interesting is the fact that one of the two readings may not be available because either a minimum or a maximum is lacking for reasons having to do with the non-linguistic context. The examples I have used to demonstrate the ambiguity of comparatives with *less* have the property that in normal situations both a minimum and a maximum is available. Planes can have both a maximum and a minimum altitude, and on highways there may be both a maximum and a minimum legal speed limit, and therefore examples like (1) and (8) allow both readings. However, (49) appears to be unambiguous. It can have the maximum but not the minimum reading.

(49)   Lucinda jumped less high than Charles can jump.

The lack of a minimum reading for (49) is not that surprising if we consider what the sentence would have to mean on that reading. In ordinary everyday contexts it simply doesn't make much sense to talk about the minimum height that people can jump. There is no minimum degree d such that Charles can jump d-high (apart perhaps from the borderline case 0). The minimum reading therefore appears to be unavailable. This is also the reason why in a sentence of this kind the comparative does not easily license NPI's, as we saw in (27).

That the presence or lack of a minimum reading is essentially something dependent on context can be seen if we consider an example like (50).

(50)   Lucinda was running less fast than Charles could.

Under most circumstances there is no minimum running speed and therefore (50) will only have the maximum reading. However, imagine that Lucinda and Charles are running down a steep hill and have to be careful not to run too fast. In such a situation the minimum reading does make sense, and the sentence is ambiguous again. If we replace *Charles* with the NPI *anybody* the sentence will only be

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acceptable in just that kind of context.

(51)   Lucinda was running less fast than *anybody* else.

Similarly, (27) will become acceptable if we can imagine a situation in which there is a lower limit to how high a kangaroo can jump.

Examples like (49) and (50) appeared to be unambiguous because in ordinary contexts there is no minimum. Are there sentences which seem to have the minimum reading, but not the maximum reading? The answer is yes, although such cases may be harder to find. (52) is an example:

(52)   Students live on less money than a professor could live on.

On its most readily available interpretation (52) means that students live on an amount of money that is smaller than the minimum amount that a professor could live on. Contrast this with (53) for which the maximum reading is most salient:

(53)   Students spend less money than a professor could spend.

Again it is probably possible to make up contexts in which these sentences are ambiguous.

The fact that in ordinary contexts *live on* only allows the minimum reading, whereas *spend* only allows the maximum reading, is related to the fact that these two verbs differ in the scalar inferences they support. The verb *spend* supports inferences from a higher to a lower amount, but not vice versa:

(54)   X can spend \$3000 $\Rightarrow$ X can spend \$2000.
(55)   X can spend \$2000 $\not\Rightarrow$ X can spend \$3000.

Live on on the other hand only allows inferences in the other direction:

(56)   X can live on \$2000 $\Rightarrow$ X can live on \$3000.
(57)   X can live on \$3000 $\not\Rightarrow$ X can live on \$2000.

We are dealing here with pragmatic scales in the sense of Fauconnier (1975a, 1975b). The inferences in (54)-(57) are pragmatic in the sense that they are not purely logical but are valid only in virtue of certain facts about the real world.

The fact that *spend* supports inferences to lower amounts whereas *live on* supports inferences to higher amounts means that for *spend* there will be no minimum but for *live on* there will be no maximum. Hence the difference in the readings we get for (52) and (53). Returning now to the example (1), this sentence is ambiguous because in this case scalar inferences are not warranted in either direction, and hence there exists both a minimum and a maximum:

(58)   This plane can fly at an altitude of 300 feet $\not\Rightarrow$
        This plane can fly at an altitude of 200 feet.

(59)   This plane can fly at an altitude of 2000 feet $\nrightarrow$
        This plane can fly at an altitude of 3000 feet.

Footnotes

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1. Complications of a different kind arise if the comparative clause contains a quantifier that is not existential. For reasons that are unclear to me such quantifiers can get wide scope over the comparative, as in the following example: *Charles is taller than everybody else is*.

References

Cresswell, M.J. (1976). `The Semantics of Degree.' In B.H. Partee (ed.) *Montague Grammar*. Academic Press, New York.

Fauconnier, G. (1975a). `Pragmatic Scales and Logical Structure.' *Linguistic Inquiry* 6, 353-375.

Fauconnier, G. (1975b). `Polarity and the Scale Principle.' In *Papers from the Eleventh Regional Meeting of the Chicago Linguistic Society*.

Hendriks, P. (1993). `Comparatives and Monotonicity.' In A. de Boer *et al.* (eds.) *Language and Cognition 3,* University of Groningen.

Hoeksema, J. (1983). `Negative Polarity and the Comparative.' *Natural Language and Linguistic Theory* 1, 403-434.

Ladusaw, W.A. (1979). *Polarity Sensitivity As Inherent Scope Relations*. Ph.D. Dissertation, University of Texas at Austin.

Rullmann, H. (1995). *Maximality in the Semantics of Wh-Constructions*. Ph.D. Dissertation, University of Massachusetts at Amherst.

Seuren, P.A.M. (1979) `Meer over minder dan hoeft.' *De nieuwe taalgids* 72, 236-239.

Stechow, A. von (1984). `Comparing Semantic Theories of Comparison.' *Journal of Semantics* 3, 1-77.

Zwarts, F. (1986). *Categoriale Grammatica en Algebraïsche Semantiek.* Doctoral Dissertation, University of Groningen.