Two Roads to Remote Relatives

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Abstract

So-called relative clauses (or relative constructions) of the third kind, commonly referred to as amount or degree relatives, remain puzzling, descriptively and theoretically. Broadening the empirical scope of the phenomenon, I consider two alternative strategies for dealing with it, one based on type lifting and the other on decomposition and ellipsis. The former is more elegant, but the latter may be more realistic.

Keywords Amount relatives · degree relatives · (third) kind relatives

1 Introduction

Characteristically, amount relatives (degree relatives, 'third kind' relatives) do not mean what they would appear to mean – which is to say that these terms really refer to certain exceptional **readings** of relative constructions (where 'relative construction' = determiner + head noun + relative clause).[1] These readings are generally more **abstract** than the normal ones. Mostly they involve degrees, although the normal readings involve individuals. How degrees are involved differs, though; **qualitative** and **quantitative** scales can be distinguished. Besides, some cases do not seem to involve scales at all, just qualities in the nonquantifiable sense of 'kinds'.

Carlson (1977) first drew attention to sentences like (1).

(1) Every man there was on the life-raft died.

He proposed that the *there be* construction is felicitous in the relative clause because this clause is an **amount** relative clause where what is modified is not the set of men but the number of men. This analysis was elaborated by Heim (1987) and von Fintel (1999).

[1] Indeed, these readings only seem to surface when the normal readings are trivial, i.e., contradictory or tautologous.

Grosu and Landman (1998) object, however, that such relatives do not have a pure degree reading, and McNally (2009) concludes that they should not be considered 'amount' relatives at all.

I will concentrate on unequivocal degree relative clauses, like the one in (2) from Grosu and Landman (1998: 18).

(2) We will never be able to recruit the soldiers that the Chinese paraded last May Day.

As noted by Herdan (2008: 45), this sentence can have more than one degree reading, not just a quantitative but also a qualitative reading.[2]

Authentic sentences can display the same ambivalence:

(3) No one will ever score the goals he did.

If *he* refers to Alan Shearer, we get a quantitative reading ('as many goals'), but if it is Roberto Carlos, we get a qualitative reading ('as good goals').

Sometimes we do not seem to get any kind of degree reading but rather a '(sub)kind' reading ('the (same) kind of wine'):

(4) Daniel was required to drink the wine that the king drank.

Degree relatives are not very widespread, but one of my goals is to show that they are more widespread than has so far been assumed. For one thing, they have been thought to be restricted to modal contexts, as in (2). Or at least to negative contexts, as in (3). But I will show, in Section 2, that not even this is borne out. – Further, it has been assumed that degree relatives are restricted to relatives – which seems trivial; however, other modifiers, in particular *of* phrases, will be seen to have degree readings too and to be in need of the same treatment.

What this treatment should be is addressed in Section 3. Taking a cue from Grosu and Krifka (2007), I first explore an option based on lifting the type of the head noun so that rather than denote a set of objects or events the noun denotes a set of sets of sets – quantifiers – with certain common properties. If now the (covert) relative pronoun is interpreted as a variable for quantifiers, then the relative clause will denote a set of quantifiers too, intersecting with the denotation of the head noun to form a smaller set – in fact, a singleton, so that the definite DP denotes its member, a quantifier.[3]

[2] There may even be a mixed reading, a question to which I will return in Section 5.

[3] Or, if the intersection is not a singleton, it is a set with a maximal element, so that the definite DP denotes that element, a sum quantifier.

This way of analyzing degree relatives is theoretically attractive because it does not involve syntactic complexity; in particular, it does not appeal to raising and reconstruction or decomposition and ellipsis. But unfortunately, it is not general enough; it cannot cope with the interaction between degree relative constructions and adverbs of multiplication, like *ten times* in (5):

(5) Fowler will score **ten times** the goals that Sebo scores.

Consequently, in Section 4 I turn to a method based on decomposition and ellipsis, where (3) is analyzed in rough accordance with the paraphrase (6a) or (6b), representing the quantitative and the qualitative reading:

(6) a. No one will ever score
the quantity (of) goals such that he scored it (of) goals

b. No one will ever score
the quality (of) goals such that he scored it (of) goals

Here what is not underlined is supplied implicitly; in particular, the concept quantity and the concept quality are interpolated (a case of decomposition) and the head noun has a copy in the relative clause (a case of ellipsis).

Let me call the sort of analysis based on type lifting the 'high road' and the sort of analysis based on decomposition the 'low road'. I wind up with a discussion of whether, especially in view of mixed quality-quantity readings and 'kind' readings, it is not advisable to keep open the high road after all, alongside the low road.

2 How Remote are these Relatives

Degree readings are commonly assumed to require silent relative pronouns – in English; for German, this does not hold true, as shown by (7).[4]

(7) Zum Spiel St. Pauli-FC Bayern am 7. Mai haben wir bei weitem
to game St. Pauli-FC Bayern on 7 May have we by far
nicht die Karten bekommen, die wir bestellt hatten, was auch
not the tickets received which we ordered had which also
verständlich ist bei der Stadiongröße in Pauli.
understandable is with the stadiumsize in Pauli

[4]I stress that I concentrate on what I call unequivocal degree or kind readings entailing, in the words of Grosu and Landman (1998), 'identity of quantity' (or quality, or subkind) without entailing 'identity of substance'.

It has also been widely noted that the choice of determiners preceding the head noun is very limited. The definite article predominates, occasionally supplemented or supplanted by a universal determiner, as in (8).

(8) Between Callao and Panama Drake took an unarmed treasure ship, bearing ... all the silver the Golden Hind could carry.

Another constraint that has been proposed is that the relative must occur in a modal context. Szczegielniak (2012), contrasting (9a) with (9b), notes that the latter "can only mean retrieving the actual spilled champagne".

(9) a. It would take days to drink the champagne they spilled that evening. (Heim 1987)

b. It took days to drink the champagne they spilled that evening.

This may be a valid observation, but not a good basis for a generalization, as degree relatives are easily found in nonmodal contexts, like (7) or (8). What does seem important, though, is negation. While the authentic (10a) clearly has a reading where the size of the audience is at issue, cases like (10b) are very rare, and this constructed example seems resistant to a degree reading.

(10) a. The band does not draw the audience that it did in the 80's.

b. The band draws the audience that it did in the 80's.

Though negation may be conducive to degree readings, it is hardly essential, however. For one thing, the degree reading is available in a positive context once the polarity is focused, as with the adverb *still* in (11).

(11) The Colosseum still draws the crowds today that it did in AD 64.

Another way of enabling degree readings in nonnegative contexts is to add adverbs of multiplication, like *ten times* as in (5) or *half* as in (12).[5]

(12) She is almost **half** the woman she used to be.

And moreover, when it comes to inalienables in *have* sentences (and degree or subkind readings), polarity does not seem to play a significant role:

(13) LeBron already has the body that 26 year old Michael Jackson had and nearly the basketball brain and eyes that Larry did at his peak.

[5]Here, interestingly, what is measured is not the quality of the woman but her weight.

One constraint which has gone without saying is that the relative must be a relative. However, degree and subkind readings of genitive constructions can be observed as well, whether the adjunct is post- (*of*) or preposed (*'s*):

(14) England does not have the mountains that Wales does.[6]

(15) New Zealand truly has the fjords of Norway, the lakes of Canada, the mountains of Switzerland, the coastline of Northern California, the gardens of England (well, almost), and ...

(16) The UK does not have Norway's oil.

The parallelism between *have* relative clauses, *of* adjuncts, and *'s* adjuncts concerning degree readings extends to functional nouns like *height* or *depth*:

(17) San Francisco may not have the height that Toronto has.

(18) Flint Pond lacks the depth of Lake Quinsigamond.

(19) Scotland doesn't have Norway's wealth.

It may not be immediately evident that degree readings are involved here. After all, these nouns are themselves degree expressions, denoting, perhaps, measure functions, so one might expect, say,

(01) the height of Mount Everest

to simply denote a specific measure: 29.029 ft. And often, so it will, but not in the context of (20).

(20) Ketu lacks the height of Mount Everest.

That would entail that Ketu lacks – or does not have – 29.029 ft, whereas what is intended is that Ketu does not have *a height of* 29.029 ft, or does not have 29.029 ft *as its height*.[7]

What precisely this interpretation consists in and how it comes about will be examined and explained in Section 4, together with analyses of the other variants of degree and kind readings. First, however, in Section 3 I explore an approach to core variants which is prima facie attractive but will eventually prove problematic.

[6] In fact, the highest English peak is the same height as the 7th highest peak in Wales.

[7] Linguistic evidence that (01) is ambiguous comes from the fact that in Scandinavian, two different prepositions are used for the case where the *of* phrase denotes an individual and for the case where it corresponds to a degree relative (*på* versus *til*).

3 The high road: lifting the head noun

In this section I explore an option based on lifting the type of the head noun so that it denotes a set of sets or even a set of sets of sets, i.e., of quantifiers, with certain common characteristics.

3.1 A case of quantity

Consider a straightforward quantitative – numerical – reading of a relative construction with a count noun as head noun:[8]

(21) We did not see anywhere near the birds that we saw last Tuesday.
(http://groups.yahoo.com/group/songstar/message/18781)

The approximative adverbial *anywhere near* probably helps bring out this reading. Still, let us for perspicuity trim the example down to its essentials, marking the trace of the covert relative pronoun with a separate underline:

(02) We did not see the birds that we had seen _____

This trace can have two different types: individual (e) and quantifier ($(et)t$). The e option is the default, but the $(et)t$ option has been considered, e.g. by Cresti 1995, in connection with Quantifier raising (to mimic reconstruction). We could try this option in connection with Relative raising here. The covert relative pronoun is interpreted as an abstraction over a quantifier variable:

(03) We did not see the birds that λQ we had seen Q

The whole relative clause thus denotes a set of quantifiers, those quantifiers that the predicate λx *we had seen* x belongs to.[9] For example this set:[10]

(04) { ⟦ *a few fish* ⟧, ⟦ *every canoe* ⟧, ⟦ *sixteen birds* ⟧, ⟦ *dark clouds* ⟧ }

For this to intersect in the usual way with the denotation of the head noun, this noun must denote a set of quantifiers as well, so it must be type lifted, e.g., in accordance with a semantic definition like this:[11]

[8] Admittedly, what is counted is here probably not individual birds but species of birds; I will ignore this complication, though.

[9] Actually, the best way to derive this may be to also apply QR to the relative pronoun, giving this LF: $\lambda Q\ Q\ \lambda x$ *we had seen* x.

[10] I ignore the extension/intension distinction here, omitting indices of evaluation.

[11] Here *birds″* is the lifted form of the noun *birds*, or *bird* really; I am not giving a proper treatment of the plural here.

(05) $[\![\textit{birds}'']\!] = \lambda Q$ for some number $n \leq 99$, $Q = \lambda P\,|[\![\textit{birds}]\!] \cap P| = n$

This set of cardinal quantifiers can be enumerated as follows:

(06) $\{ [\![\textit{one bird}]\!], \ldots, [\![\textit{sixteen birds}]\!], \ldots, [\![\textit{ninety-nine birds}]\!] \}$

The denotation of the whole relative construction, the intersection between the denotation of the relative and that of the head noun, is the intersection between the set enumerated in (04) and the set enumerated in (06), namely:

(07) $\{ [\![\textit{sixteen birds}]\!] \}$

As a singleton, this is a good input for the definite article, which transforms it to the element it contains, namely, the cardinal quantifier $[\![\textit{sixteen birds}]\!]$.

(08) $[\![\textit{the birds}'' \textit{ that we had seen}]\!] = \lambda P\,|[\![\textit{birds}]\!] \cap P| = 16 = [\![\textit{sixteen birds}]\!]$

3.2 A case of quality

With suitable adjustments, this method of analysis can be adapted to other variants of quantitative readings and to qualitative readings.

It easily gets rather complex, however, especially in qualitative cases.[12] Let us therefore consider a case where the covert relative pronoun's trace is not a quantifier variable but a predicate variable, so that the relative does not denote a set of sets of sets (type $((et)t)t$) but a set of sets (type $(et)t$). Grosu and Krifka (2007) provide an analysis of such cases, which they call "degree property relative clauses".

(22) I am not the painter $\underline{\lambda P}$ he is $\underline{\underline{P}}$.

Their analysis is analogous to the above analysis of the quantitative case (21), modulo the lower type, which is now between the one used above and the normal type. They assume a relation DEGREE which maps a property like $[\![\textit{painter}]\!]$ to a set of sets of individuals, those sets that for a certain degree of painter quality contain the individuals who share it.

(09) $[\![\textit{painter}'']\!] = \text{DEGREE}([\![\textit{painter}]\!]) = \lambda P$ for some degree d, $P = \lambda x\,[\![\textit{painter}]\!](x)$ and the quality of x as a painter is d

The denotation of the relative clause is also a set of sets, including:

[12] For one thing, the intersection will often not be a singleton, in which case one must, it would appear, appeal to sum quantifiers and maximization.

(010) $\{ [\![\textit{fifty-seven years old}]\!], [\![\textit{a damn good painter}]\!], [\![\textit{altruistic}]\!] \}$

The intersection between (09) and (010) might then consist in the singleton

(011) $\{ [\![\textit{a damn good painter}]\!] \}$

And the definite article can turn this into the set $[\![\textit{a damn good painter}]\!]$. This still fails to predict, though, that (22) entails that I am a worse painter than he is, not just that I am either a worse or a better painter than he is. There is a solution to this problem, but it requires using $\geq$ in (09), forming a set of plural (sum) sets, and interpreting maximization as intersection.

Worse, this sort of analysis is not able to account for cases where the relative construction is modified by an adverb of multiplication, as in (23).

(23) Maria Elena is twice the painter that Juan Antonio is.
(Woody Allen, *Vicky Cristina Barcelona*)

In fact, Grosu and Krifka (2007: 466) analyze a parallel example, (24), and provide (012) as a metalinguistic representation, assuming "that for degrees certain operations like ... multiplication are defined".

(24) Bill is twice the mathematician his mother was.

(012) $2\,\iota\,(\lambda P[\textsc{degree}(\mathrm{i})(\textsc{math})(P) \wedge P(\mathrm{i})(\textsc{bill's mother}(\mathrm{i}))])$

Note that what the multiplier 2 is here applied to is not strictly a degree but a property – but it is understood to correlate one-to-one to a degree.

It remains to be seen whether this analysis can be extended to the higher type under consideration in section 3.1.

Another issue with the type-lifting approach is that it is hard to reconcile with cases where words like *quantity* or *quality* are explicitly mentioned.

(25) I didn't see the quantity of girls this guy saw but I still saw ...

(26) Brazil does not have the quality of players that Ivory Coast has.

These cases point the way towards an alternative analysis.

4 The low road: decomposition and ellipsis

This strategy rests on the double assumption that (i) the apparent head noun is decomposed into a degree expression, usually also a pro forma determiner, and the remnant noun, (ii) the relative clause is elliptic, containing a copy of the remnant noun, and modifies the degree expression in the matrix.

4.1 Quantitative readings

Let us focus on a parallel to (21) with *number of birds* instead of just *birds*:

(27) Didn't see the number of birds that I saw on Tuesday, but ...[13]

It is practical to strip the example down to its bare essentials, and, as before, to mark the trace of the covert relative pronoun with a separate underline:

(013) I didn't see the number that I had seen _____ (of birds) of birds.

This already implies that the surface word order belies the true structure: despite appearances, *of birds* is not part of what is modified by the relative, only the word *number* is. Plus, the relative contains an elliptical *of birds*. In one form or another, this assumption is shared by earlier analyses going back to Carlson (1977) (though movement is not assumed here).

(013) is still incomplete, even after including a number variable (binder) for the covert relative pronoun (trace): to drive the composition of the two cardinal quantifiers (one in the matrix clause and one in the relative clause) we need to posit a special determiner, det:

(014) (det) the number that λn I had seen (det) n (of birds) of birds

This special determiner could have the following meaning:

(015) $\lambda n \lambda P \lambda Q |P \cap Q| = n$

In the context of the relative clause in (014), P is the set of birds and Q is the set of things I had seen. Now if I had seen exactly sixteen birds, the relative clause will denote the singleton set containing just the number 16. The head noun, denoting the set of all natural numbers, then intersects with that singleton set, resulting in the same singleton set. Next, this singleton set becomes its member when the merge with the definite article is interpreted.

(016) $[\![$ the number that λn I had seen (det) n (of birds) $]\!] = 16$

Applying (015) to (016) and applying the result to the denotation of *of birds*, we get (017) as the denotation of the whole relative construction.[14]

[13] http://www.texashuntingforum.com/forum/ubbthreads.php/topics/887092/Jasb

[14] As noted in connection with (22), a 'greater than or equal to' interpretation (of det) is preferable to the 'equal to' interpretation assumed in (015); then, however, the relative clause will not denote a singleton set but the set containing all the numbers $1-16$, and the definite article will have to effect a maximization yielding, after all, the number 16.

(017) $\lambda Q|[\![\, \textit{birds} \,]\!] \cap Q| = 16$

Note that because the DP *the number of birds I had seen* denotes a number, adverbs of multiplication can straightforwardly combine with it.

The quantitative reading of a sentence like (21) is a reading that results from decomposing the apparent head noun into a component denoting the set of numbers and the noun and merging the relative with the former.

If, as in (8) and (9a), the apparent head noun is a mass noun, the first component will not plainly denote the set of numbers but the set of amounts or quantities, relative to a certain measurement (such as volume or weight). In a case like (8), the role of the determiner that must usually be posited (as the one defined in (015)) is played by the overt universal.

4.2 Qualitative readings

A qualitative degree reading remains to be analyzed. Consider (26) and the trimmed and restructured version (018).

(018) B doesn't have the quality that IC has __ (of players) of players.

To keep matters reasonably simple, I stop short of decomposing *quality* into degree and measure relation, treating it as though it were to denote a set of degrees. The covert determiner posited above the definite article is now not a pro forma cardinal determiner but an indefinite determiner, and, it is to apply above the noun as well.

(019) (ind) the quality that λq IC has (ind) q (of players) of players

The relative clause will then denote a set of degrees of goodness (for soccer players): those such that there are some that good Ivory Coast players. Say, on a scale from 1 through 10, $\{\ 6, 8, 9\ \}$. There are now various options as to how the definite article effects a maximization on the basis of $\{\ 6, 8, 9\ \}$. The simplest is to select the highest degree; in that case, the whole relative construction will denote the quantifier $[\![\, \textit{some 9-good players} \,]\!]$. The sentence as a whole will be true just in case Brazil has no players that are that good. To be sure, this is an oversimplification, but it is not too far off the mark.

Again (mutatis mutandis), the qualitative degree reading of sentences like (2), (3) or (13) will result if the apparent head noun is decomposed into a component denoting the set of degrees of goodness (actually, a component for a set of degrees + a component for a measure relation of goodness relative to the noun) and the noun, and the relative is merged with the former.

4.3 K2 lacks the height of Everest

Let us now return to the 'third kind relative'-like *of* phrases as in (18) or (20), slightly modified to (28).

(28) Ketu does not have the height of Mount Everest.

A 'low road' explication of the logical form of the argument of *have* is (020).

(020) the (measure) λm m (high) of ME (as) (it_2s) height

Under the simplest of assumptions now, the long underlined expression will denote the measure 8.848 m, and the whole SC will be true in case the height of the value assigned to the variable 2 – in the sentence context, K2 – is that measure (see Sæbø 2009 on the meaning of *have*). The sentence (28) will be false in the same circumstances. (Again, it may be better to use $\geq$.)[15]

5 Discussion. Quality-quantity mix. Meta issues

No clear thoughts yet

5.1 Subkind readings

For subkind readings, an in-between road seems to be the only way.

(4) Daniel was required to drink the wine that the king drank.

This way consists in positing an indefinite determiner (*some*) above *the* and lifting the head noun to a set of subkinds, as Grosu and Krifka (2007) do it.

(021) to drink (some) the wine' that λP the king drank (some) P

(022) $[\![\textit{wine}']\!]_w = \lambda P$ for some Q, SUBKIND($[\![\textit{wine}]\!]$)(Q) and $P = Q_w$

Let us say that the only P that Nebuchadnezzar drank some of and that was a subkind of wine was wine mixed with blood. Then the relative construction will denote $[\![$ *wine mixed with blood* $]\!]$ (at the index of evaluation).

[15] True, a simpler analysis would be made possible by assuming an elliptical *height* in the matrix instead of an elliptical *high* in the adjunct. Cases like the following, however, seem to defy this treatment: "If we could design the human being in any way we wanted, presumably we would all have the powers of Spiderman if not Superman, as well as twice the wisdom of Socrates, the sexual prowess of Casanova, the... virtue of the Virgin Mary, and the resilient tenacity of cockroaches." (R. Baumeister, *The Cultural Animal: Human Nature, Meaning, and Social Life*)

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