

Topic, Focus, and Quantifier Raising

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This paper investigates the correlation between information structure and quantifier scope. It has often been noted that intonation seems to influence scope relations, yet no one has given a satisfactory account of this influence. I try to show that Quantifier Raising in a language like English depends on information structure, and thus indirectly on intonation, in much the same way as does DP scrambling in a language like German. I propose a theory where Quantifier Raising emerges as a side effect of a more general operation, covert in a language like English but overt in a language like German.

1 Introduction

It has been widely assumed that sentences like (1) or (2) are ambiguous between the reading where the subject or adverb has scope over the object and an **inverse** reading, where the object takes scope over the subject or adverb.

- (1) A woman loves every man. (Montague 1970)
(2) He doesn't hate most of the songs. (Jackendoff 1972)

Various techniques have been devised for deriving this category of inverse readings. Generative grammarians have tended to assume in some form the LF movement operation **Quantifier Raising**. The object would get wide scope by raising covertly to some position ultimately *c*-commanding the subject (or a trace of it) or adjunct.

Now, as Chomsky (1995: 377) puts it, the status of Quantifier Raising (QR) has been the topic of much controversy. One issue is the issue of **overgeneration**. Unless the operation is constrained, it creates readings not intuitively available. There are two aspects of this: The **crosslinguistic** and the **prosodic** aspect.

There are languages where QR evidently has no role to play. One is German, where (Frey 1993) scope ambiguities can only come about through overt movement of a QP, topicalization or scrambling. It is of course desirable to derive such facts from other properties of the language. It can be shown, however, that syntactically based attempts at constraining (Aoun and Li 1993) or eliminating (Kitahara 1992) LF Quantifier Raising cannot carry over to German.

The prosodic issue can be formulated thus: Why is it that, as many have noted, inverse readings may be more or less available, depending on intonation? A sentence may be ambiguous on paper, but once it is spoken, the ambiguity may be resolved. Intonation is taken to convey partial information about discourse or information structure, and some (Kadmon and Roberts 1986, Büring 1996) have tried to draw a connection between scope and notions like topic and focus. Others (Krifka 1994) have attempted to build a bridge between scope and accentuation via syntax.

These approaches offer valuable insights, but none gives a complete answer to the question of the relation between prosody and scope. I suggest that scope inversions attributed to QR depend on information structure in a similar way as the partition of a sentence into the restrictor and the nuclear scope of a quantificational adverb. In particular, I hypothesize that an object QP can undergo QR iff it is (S-) topical. In a general sense, this idea is in tune with a position held by Praguean linguists (cf. e.g. Peregrin 1996: 241), and with aspects of the work of Diesing (1992).

The idea that QR depends on topicality is interesting in relation to German, where there is no (covert) QR but there is (overt) DP scrambling, an operation commonly assumed to (i) extend the scope of a QP and (ii) be information structurally motivated. This opens the prospect of dispensing with QR as a separate notion. It is imaginable that QR is just a special case – the truth-conditionally visible subset – of a more general DP raising operation, covert in English but overt in German.

I follow von Stechow (1994), Büring (1996), and Vallduví and Engdahl (1996) in assuming, in principle, a three-way partition of a sentence into (1) a topic (also termed sentence-, or S-topic, or theme), (2) a ground (also termed discourse-, or D-topic), and (3) a focus (also termed rheme), where a topic may be absent. The topic and the focus consist in new information and will contain an accent.

It can be difficult, notably in English, to distinguish between topic and focus; i.e. to tell in a sentence with two accents which marks the topic and which the focus. Both in this regard and concerning the range of the topic or focus marking, i.e. how far it projects, grammatical signals underdetermine the information structure. It has been claimed that certain tones, like the English fall-rise, identify a topic, but in general, only the larger discourse ultimately disambiguates the structure.

It is customary to let a question play the role of a disambiguating context. In an answer to a *wh* question, what corresponds to the *wh* word will count as focus. There may now be another piece of information not given in the question, a topic, as in indirect answers like (3) and (4). In the terms of Büring (1996), in (3) we have a case of a **partial** topic, while in (4) we have a case of a **contrastive** topic. Characteristically, a phrase containing a new information topic modifies a given phrase, specifying it, as in (3), or substituting an alternative, as in (4).

- (3) – Who harvested the vegetables?
 – I think the CHILDREN harvested the CARROTS.
 FOCUS TOPIC
- (4) – Who is going to pick the apples?
 – I heard that the PARENTS are to pick the PEACHES.
 FOCUS TOPIC

2 QR and German

Beck (1996: 44) conjectures that because in German, scope order *can* be made clear at S-Structure, it has to be. One interpretation of this idea is that whatever features drive QR are ‘strong’ in German, causing overt movement. This overt movement – predominantly scrambling – affects not only QPs but DPs in general, and, what is

commonly assumed to induce it – primarily information structural factors – seems to work in a uniform way for QPs or other DPs. This makes it sensible not to consider “overt QR” separately but to view it as a case of a more general operation.

2.1 Scrambling and Information Structure

According to Rosengren (1993: 290ff.), scrambling is a means for a constituent to escape the ‘nuclear focus domain’ and maybe to form a separate focus domain, whereas Haftka (1994: 148ff.) considers scrambling as movement to the specifier of a topic (or secondary focus) category, to have the corresponding feature checked. In particular, there is a tendency for a topic to scramble across a focus, as shown in (5) and (6), direct translations of (3) and (4) above, respectively.

- (5) – Wer hat das Gemüse geerntet?
 – Ich glaube, daß [die MOHRRÜBEN]_T [die KINDER]_F ernteten.
- (6) – Wer wird die Äpfel pflücken?
 – Ich habe gehört, daß [die PFIRSISCHE]_T [die ELTERN]_F pflücken sollen.

According to informants, the base order versions are less felicitous. This agrees with the stipulation made by Büring (1996: 57) that “there is a constraint banning the surface order Focus before S–Topic”. Specifically, a focus cannot scramble across a topic. Generally, it seems that what makes an object scramble or topicalize across a subject or an adjunct is primarily its function as a topic in the sentence.

2.2 Scrambling and Quantification

We know that in German, an object QP can only outscope a VP adjunct or a subject QP if it overtly moves across it. The last section concluded that such overt movement is highly sensitive to the information structural status of the object DP. Essentially, it should include a topic. What this amounts to is that an object QP can only outscope a VP adjunct or a subject QP if it includes a topic. In (7), the object includes a focus and we do not get scrambling, while in (8), the object includes a topic and we do get scrambling:

- (7) – Wieviele der Romane haben die Schüler gelesen?
 how many the novels have the students read
- a. – Da hat [fast JEDER]_T Schüler [mindestens EINEN]_F Roman gelesen.
 there has almost every student at least one novel read
- b. ?? – Da hat [mindestens EINEN]_F Roman [fast JEDER]_T Schüler gelesen.
- (8) – Wieviele der Schüler haben die Romane gelesen?
 how many the students have the novels read
- a. – Da hat [mindestens EINEN]_T Roman [fast JEDER]_F Schüler gelesen.
 there has at least one novel almost every student read
- b. ? – Da hat [fast JEDER]_F Schüler [mindestens EINEN]_T Roman gelesen.

(7)a. only has the reading where the subject scopes over the object, while (8)a. in addition has the reading where the object scopes over the subject. Summing up:

- An object QP cannot scope over a VP adjunct or a subject QP if it is focal and the adjunct or subject is topical, but it can if it is the other way around.

This result is not only valid as long as the relevant constituents are confined to the middle field but also as soon as the forefield is taken into account. Thus (9)a. is unambiguous while (9)b. is ambiguous. The former fact argues against the analysis of Krifka (1994), which does not distinguish between a topic and a focus accent.

- (9) a. – Wieviele der Romane haben die Schüler gelesen?
 – [Fast JEDER]_T Schüler hat [mindestens EINEN]_F Roman gelesen, ...
 almost every student has at least one novel read
- b. – Wieviele der Schüler haben die Romane gelesen?
 – [Fast JEDER]_F Schüler hat [mindestens EINEN]_T Roman gelesen, ...

3 QR and English

I aim to show in this section that information structural factors influence QR in English. The idea is not new, as it has repeatedly been noted that intonation seems to play a role in this regard. As I see it, intonation is an indicator of information structure, but not a perfect one. Specifically, I aim to show that in a sufficiently clear context, what counts as focus cannot undergo QR across something which counts as topic, while the converse is throughout possible and often even preferred.

3.1 QR: Topic and Focus

Consider the following hypothesis.

- A focal object QP cannot scope over a topical subject QP or VP adjunct.
 But a topical object QP can scope over a focal subject QP or VP adjunct.

We need to clarify what we mean by a focal or topical QP. Let us say that a focal or topical QP is a QP which includes, properly or improperly, a focus or topic, or is included in a focus or topic. Let us start by considering indirect, more precisely, **partial answers to wh questions where a determiner is a (partial) topic.**

- (10) a. – How many meetings did the candidates attend?
 – [SEVERAL]_T candidates attended [EVERY]_F meeting.
- b. – What did the candidates attend?
 – [SEVERAL]_T candidates attended [every MEETING]_F.
- c. – What did the candidates do?
 – [SEVERAL]_T candidates [attended every MEETING]_F.

(10) testifies to the first half of the hypothesis: Whether the focus is wide or narrow, the declarative sentence doesn't have a reading where the focal object QP scopes over the topical subject QP. For the second half of the hypothesis, consider (11).

- (11) a. – How many candidates attended the meetings?
 – [SEVERAL]_F candidates attended [EVERY]_T meeting.

- b. – Who attended the meetings?
– [Several CANDIDATES]_F attended [EVERY]_T meeting.
- c. – What happened at the meetings?
– [Several CANDIDATES ATTENDED]_F [EVERY]_T meeting.

Here, the declarative sentence does have a reading on which the object QP, now topical, scopes over the now focal subject QP. We may vary the determiners and thereby increase or decrease the plausibility of one or the other interpretation. In principle, however, there will be two readings in these cases. Another way to vary the examples is to widen the topic, as in (12), where in a. the (implicitly partitive) subject QP and in b. the (implicitly partitive) object QP is the topic. Again, the focal object cannot scope over the topical subject, while the converse is possible.

- (12) a. – How many meetings did the candidates attend?
– [Several DEMOCRATS]_T attended [EVERY]_F meeting.
- b. – How many candidates attended the meetings?
– [SEVERAL]_F candidates attended [every RALLY]_T.

The above hypothesis is also concerned with the scope interaction between a VP adjunct and an object QP. Indeed, we observe that as a partial answer to a wh question, a sentence with a quantificational adjunct and a quantificational object can have different readings according to whether the adjunct is a (partial) topic and the object includes a focus, as in (13)a., where QR is evidently not possible, or whether it is the other way around, as in (13)b., where QR is evidently possible.

- (13) a. – How many of these pieces do you play when you give a concert?
– We [USUALLY]_T play [two or THREE]_F of them.
- b. – How often do you play these pieces when you give a concert?
– We [USUALLY]_F play [two or THREE]_T of them.

The ambiguity of b. is a problem for the analysis of Kadmon and Roberts (1986), who treat a parallel case as unambiguous, considering only a context parallel to a.

3.2 Other Cases

We have only been considering answers to questions, as these contexts are particularly good indicators of the topic–focus structure. Other contexts may be less clear. But it is possible to find declarative environments identifying one QP as focal and another as topical. Citing (14)a., Lakoff (1971) remarks that the inverse reading is easier to get with heavy stress on the determiner. (14)c. seems to be the sort of setting where the accent has this effect, while in (14)b. this reading is blocked:

- (14) a. Many men read few books.
- b. The recent survey of the reading habits of American males revealed that [many]_T men read [few books]_F.
- c. The recent statistics from the publishers’ association shows that [many]_F people read [few]_T books.

We may also consider what might be natural contexts for (slight modifications of) (15)a.: (15)b., where the object is focal and the inverse reading is not available, and (15)c., where the object is topical and the inverse reading is available.

- (15) a. Somebody loves everybody.
 b. The staff in the orphanage are very caring people.
 Some love every child.
 c. The children in the orphanage are happy.
 Somebody on the staff loves everybody.

Furthermore, we have only been concerned with the relative scope of two phrases where one is topical and the other is focal. It is desirable to strengthen the above hypotheses to say that an object can scope over a subject or adjunct iff it is topical. However, it does seem possible for a focus to scope over a ground. What can be said about the relevant cases is that they do not necessarily involve movement. Then we can maintain the following generalization: An object can take scope over a subject or an adjunct *by movement* if and only if it is topical.

A note on *can*: It is predicted that a sentence with a topical object is ambiguous. This can be modelled in two ways. Either we say that QR is optional. (Note that in German, scrambling is hardly ever mandatory.) Or, we say that QR can be reconstructed, only that reconstruction is not conceived of as backward movement. Rather, there is the possibility that the raising operation leaves a trace of type $\langle\langle e,t \rangle, t \rangle$, in which case it does not have a scopal effect (Heim and Kratzer 1997).

4 Conclusions

I have tried to show that in English, such scope inversions that are assumed to come about through QR are subject to information structural constraints. This result is interesting in itself, as it answers the question of why such scope inversions seem to depend on intonation. However, it is even more interesting to compare English with German in this regard and to note that these constraints are more or less the same as those underlying the overt raising operation known as DP scrambling, and that beyond scrambling, there is no German counterpart to Quantifier Raising.

If we choose a strong interpretation of these facts, we are able to answer two more questions: Why should QR be constrained by information structure? And: Why is QR covert in English but overt in German? We may say that QR is constrained by information structure because QR is information structurally driven. And, QR is covert in English but overt in German because scrambling is overt in German but covert in English. This, in turn, might be phrased as a weak–strong distinction in the relevant information structural feature, a *topic feature*.

The assumption of a general covert ‘topic’ operation in English may be dubious, notably from the point of view of economy. In fact, Fox (1995) has argued that QR takes place only if it creates another reading. This may cause us to choose a weaker interpretation. Anyway, if the representation of the facts is correct, we should be able to dispense with the notion of QR as a separate and ill understood phenomenon. Quantifiers do not raise because they are quantifiers but because they are topics.

Thus QR reduces to operations which may remain ill understood syntactically but for which we have to provide an explanation independently – such as scrambling. So if further research can confirm the picture, a significant set of ambiguities – scope ambiguities supposed to involve QR – emerge as ultimately pragmatic ambiguities, partially resolved by the information structure of the sentence.

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