North East Linguistics Society

Volume 23
Issue 1 *NELS 23: Volume 1*

Article 6

1993

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1. Introduction

Since May (1977, 1985) the relative scopes of quantified NPs (henceforth, QPs) have been taken to follow from the theory of LF movement, once a suitable Scope Principle is adopted. May's theory predicts that whenever two QPs are present in the same domain, they can be interpreted in either scopal order. It is well-known that this prediction is in general not correct: a great many of the predicted ambiguities are absent. It is standard practice to choose QP to be *every N* when you wish to illustrate everything that QR can or cannot do. In this paper I argue that QPs like *every N* are not just "best citizens" for QR -- in fact, they are the only type of QP that undergoes QR. Other QPs take scope over just their S-Structure c-command domain, or their virtual wider scope derives from a higher (un)selective binder.

Below, I first review data based primarily on Liu (1990) that illustrate the scopal deficiencies of QPs. Then I go on to propose the following "minimalist" theory of scope:

(1) Taxonomically, the QPs that I examine here come in three varieties:
   a. Bare numeral QPs (BNQP): six men, many men,...
   b. Modified numeral QPs (MNQP): fewer than six men, more than six men, exactly six men, ...
   c. Distributive universal QPs (DUQP): every man, ...

(2) The determiners in both MNQPs and DUQPs are quantifiers over individuals. The determiners in BNQPs on the other hand are ambiguous: they can be either

* I am grateful to Anna Szabolcsi for continued advice and many insights in the matters discussed here. This paper would not have been possible without her support. Thanks also to Dorit Ben-Shalom, Ed Keenan, Barry Schein, Dominique Sportiche, Tim Stowell, and Frans Zwarts for very helpful discussions.

cardinality predicates or quantifiers over individuals. The second option obtains when the determiner is focused inside the QP.

(3) A QP whose bare numeral is interpreted as a cardinality predicate is just a restricted (set-)variable, in the sense of Heim (1982) and Schein (1993). It can be bound by existential closure. Thus it does not have scope by itself, but the scope of its binder is perceived as its scope (I will call this "virtual scope").

(4) QR does not raise arbitrary quantifiers; it only raises distributive universals. This raising is perhaps forced by the needs of "distributor morphology".

(5) It follows from (2) through (3) that MNQPs never take scope over another QP that c-commands them at S-structure. Since their determiner is a quantifier, they cannot be bound by a higher binder and acquire wider virtual scope. Not being distributive universals, they do not raise by QR, either. As quantifiers, however, they are fully capable of making c-commanded QPs referentially dependent.

The above proposal paints a black-and-white picture: some readings are predicted to be in, others are predicted to be out. The data are more complex in that some of the "in" readings are less readily available than others. I will address this question and attribute marginality to Weak Cross-Over.

2. Basic Data

In this section, I introduce the basic data that I will consider in this paper. The discussion will focus on asymmetries of scope construal in clauses where QPs occur in argument positions: for most part, I will be looking at subjects and objects. By scope readings I mean readings that establish referential dependencies between the QPs in the clause. Much of the data comes from Liu (1990), the first systematic study of what scope ambiguities arise with a large variety of QPs.

It is known that scope construals that don't match S-Structure c-command relations are usually not readily forthcoming. Sometimes they are (i) possible and relatively natural, but more often they are (ii) quite unlikely, though possible, or (iii) impossible. To begin with, consider:

(5) Two students passed four classes *[3 readings: S>O, O>S, IND]*

Restricting our attention to fully distributive readings, (5) is standardly taken to have three different readings, each corresponding to a different referential dependency constellation between the QPs. These dependencies can informally be described as follows.

(a) The subject takes wide scope and makes the object referentially dependent (henceforth, S>O): the subject is interpreted as denoting a unique set of individuals, and each of these is related to a set of four classes that (s)he passed. The classes may be totally different for each student: we may be describing a situation where there are 2 students and 8 classes.

(b) The inverse dependency holds: the object is taking wide scope and making the subject referentially dependent (O>S). The sentence means that there is a unique set of four classes, and that each of these classes was passed by two students, possibly different ones for each class. We may be referring to 4 classes and 8 students. This reading is much less likely to arise than the S>O reading, but it is possible. Consider the following context: "Classes in this department are becoming incredibly tough; it has gotten to the point where maybe three students would pass. Last month has been the worst ever: two students passed four classes".

(c) Finally, the independent reading (IND): both QPs are taken to refer to unique sets of individuals, and each member of the set of students has passed each of the four classes; there can be, then, only 2 students and 4 classes we are referring to.

The (fully distributive) readings of (5) can be summarized as follows:

(5) a. [S>O] *each of two students passed (possibly) different sets of four classes (2 students, 8 classes)*
b. ? [O>S] *each of four classes was passed by two (possibly) different students (4 classes, 8 students)*
c. [IND] *there are two independently chosen sets of two students and four classes, and each student passed each class (2 students, 4 classes)*

Consider now sentence (6):

(6) Two students passed fewer than six classes

(6) contains a comparative, and semantically, monotone decreasing, indefinite: *fewer than six classes*. (6) does not have a reading parallel to (5b) or (5c), but only the following:

(6) a. [S>O] *each of two students passed (possibly different) sets of fewer than 6 classes*
b. * [O>S] *each of fewer than six classes was passed by two (possibly) different students*
c. * [IND] *there are two independently chosen sets of two students and fewer than six classes, and each student passed each class*

As we will see, (6a) is parallel to a reading of (5) not listed above: "each of two students passed classes, (exactly) four in number." Such reading may be conveyed by (5) when the numeral *four* is stressed.

Crucially, the O>S reading is absent in (6): one could not force O>S by including (6) in the context devised above for the O>S reading of (5), as the reader may verify.

The contrast between (5) and (6) might suggest that the absence of O>S in (6) is really a semantic effect, since many QPs that behave scopally like *fewer than six classes* are either monotone decreasing or non-monotone. The next contrast, however, shows that it is a syntactic effect, and as such requires a syntactic account. Compare (6) and (7) below: (7), where the decreasing indefinite occurs in subject position, has again both [S>O] and [O>S][1]:

(7) Fewer than six students passed four classes
a. [S>O] *each individual in a set of less than six students passed (possibly) different sets of four classes*
b. ? [O>S] *each of four classes was passed by a (possibly) different set of less than six students*

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[1] It is unclear whether (7) also has a reading comparable to the [IND] reading of (5). I will not consider this possibility in the paper. For a study of scope independent readings, see Beghelli-Szabolcsi-Zwarts (1993).

Furthermore, as pointed out by Szabolcsi-Zwarts (1992), there cannot be any semantic incoherence in the O>S reading of (6), since this reading is available in different syntactic packages:

(8) a. Fewer than six classes were passed by four students
b. Fewer than six classes did two students pass

The scopal behavior of *fewer than six classes* is not unique: there is a whole class of QPs that behave analogously. Aside from *few* and *no*, all the determiners that build QPs that behave scopally like *fewer than six classes* have the shape 'modifier+numeral'. Henceforth, I will refer to such QPs as modified-numeral QPs, or MNQPs for short, and distinguish them from bare-numeral QPs, like *two students, four classes*, etc. It is easy to show that monotonicity does not offer the correct semantic generalization for MNQPs. The class of MNQPs includes QPs built by the following determiners:

(9) i. decreasing indefinites: *fewer than six, at most two, ...*;
ii. comparatives, a mixed bag in terms of monotonicity: *more-than five, less-than six, more [students] than [teachers], ...*;
iii. *only*+numeral: *only three, ...*;
iv. non-monotone modified numerals: *exactly three, between two and five, ...*;
v. monotone increasing modified numerals: *at least four,...*

An independent semantic characterization of these Qs is elusive: they do not form a natural class in terms of monotonicity properties, for instance. Increasing NPs like *more than five, at least four* occur side by side with decreasing and non-monotone. Yet, all have similar scopal properties.

3. MNQPs Take Scope *In-Situ*

The data introduced in the previous section show that many scope ambiguities predicted by a theory of scope by LF-movement, such as May's, are in fact missing[2]. In addition to supporting this claim with further data, in this section I will defend the following claim:

(10) MNQPs take scope in the position they occupy at S-Structure (*in-situ*)

The data in (6) and (7) showed that MNQPs (i) as objects, do not take scope over a BNQP subject; (ii) as subjects, do take scope over a BNQP object. This behavior is not limited to the relation between MNQPs and BNQPs. The same observations can be made when an MNQP interacts with a distributive-universal QP (DUQP):

(11) Every student passed fewer than six classes
a. [S>O] *each student passed a (possibly) different set of fewer than six classes*
b. * [O>S] *each of fewer than six classes was passed by every student*

(12) Fewer than six students passed every class
a. [S>O] *each individual in a set of less than six students passed every class*
b. [O>S] *every class was passed by a (possibly) different set of less than six students*

[2] This criticism applies to all grammars that allow quantifying-in for any QP, e.g, Montague 1971.

The object-wide-scope, available in (12), is missing in (11). The same results obtain when an MNQP interacts scopally with another MNQP:

(13) More than five students passed fewer than six classes
a. [S>O] *each student in a set of more than five passed a (possibly) different set of fewer than six classes*
b. * [O>S] *each of fewer than six classes was passed by a (possibly) different set of more than five students*

Furthermore, the inability of MNQPs to take scope over an S-Structure c-commanding QP is not limited to the object position. As indirect objects, MNQPs do not take scope over a subject QP, nor an object QP. I will illustrate only the case where the QP is a BNQP. Consider:

(14) Two professors gave three students fewer than six books

The readings listed below are in fact excluded (since these are irrelevant to the point here, I am overlooking the referential dependencies between S and O, and grouping more than one reading under the same header):

(14) a. * [IO>S] *for each book in a set of fewer than six books, there are two (possibly) different professors who gave the book to three students*
b. * [IO>O] *for each book in a set of fewer than six books, there are three (possibly) different students such that two professors gave the book to the student(s)*

The data show that MNQPs in argument positions (a) are indeed scopal elements; (b) are not *a priori* restricted in their scopal abilities. In other words: they are not prevented from taking wide scope. In this respect, they are not 'only-narrow-scope' items (like mass terms) that never take wide scope irrespective of their position.

To further corroborate (b), the following examples show other cases where MNQPs are able to induce referential dependencies over indefinites that they c-command at S-Structure. Cases not involving the subject, but the object position, are illustrated by the gloss provided for a sentence like:

(15) I persuaded fewer than six students to take two classes
for fewer than six students, I persuaded her/him to take two (possibly different) classes

Similarly, in double object and dative constructions an MNQP can make a c-commanded BNQP referentially dependent:

(16) a. I gave fewer than six books to two students
b. I gave fewer than six students two books

The following are, among others, readings of (16) a. and b., respectively:

(16) a'. *I gave each of fewer than six books to two (possibly different) students*
b'. *I gave each of fewer than six students two (possibly different) books each*

Further evidence that MNQPs take scope only on elements they c-command at S-Structure is provided by inverse-linking (IL) nominals. In IL, an NP containing two QPs is interpreted

with the QP that is syntactically lower taking wide scope over the whole nominal. IL is out when the syntactically lower QP is an MNQP:

(17) a. ?* Two pictures of fewer than six senators were on sale [under IL]
b. ?* Two pictures of more than six senators were on sale [under IL]

The descriptive generalization in (10) appears thus supported. If MNQPs are always interpreted as taking scope in their S-Structure position, and yet are able to make a QP they c-command at S-Structure referentially dependent, the only plausible conclusion is:

(18) QR does not apply to MNQPs.

In section 8 I will discuss why it should be so.

4. A Minimalist Perspective on Scope

The picture that emerges at this point is not just that some scope ambiguities predicted by May's theory are missing. Rather: the scope ambiguities that do arise are strikingly fewer than expected under the assumption that LF-movement applies generally to quantified phrases.

The solution that I would like to propose does not consist in doing QR and blocking it in a number of cases, but simply in not doing it in most cases. In the next sections, I will try to show that this view should be considered as an alternative.

This program would seem to make sense from a 'minimalist' view-point (cf. Chomsky 1992). In this perspective, the question to be answered by a theory of LF-movement is ultimately: why should QPs raise? If movement is driven by morphological licensing, quantifiers shouldn't move just to disambiguate the sentence. There has to be a special reason, of a morphological type.

The strong point of May's theory of LF-movement is the characterization of the scopal properties of DUQPs, like those built with *every*. He provides considerable evidence for its movement by adjunction (to IP or VP, and perhaps to NP). There is no reason (that I know of) to assume that DUQPs take scope differently than predicted by May's theory.

Possibly, it could be suggested that this is because they are the only ones to embed a distributing operator, a morphological feature that requires licensing, and thus drives movement by QR. This requires further research.

The unique behavior of DUQPs seems also confirmed by the fact that other strong, but not so fully distributive quantifiers do not provide real evidence of movement at LF. One case in point is *most*.

Even the simplest case of sentences like the following, that offer a good pragmatic context for the O>S reading, do not seem to have it.

(19) a. A salesrep convinced most customers at the convention [*?O>S]

If DUQPs are the only things that undergo QR, the next task is to account for the scopal properties of the remaining class of QPs: BNQPs. This is the subject of the next section.

5. Scopal Properties of BNQPs

BNQPs are the wildest in terms of scope. They exhibit a surprisingly diverse behavior with respect to scope-taking:

(20) i. They can easily be interpreted as referentially dependent (hence, narrow scope) when c-commanded at S-Structure by another QP;
ii. They may (much less naturally) be interpreted as referentially dependent even when they c-command a clause-mate universal or BNQP;
iii. They equally well display the opposite tendency: they can be absolutely independent (=widest scope) in the sentence.

(20i) and (20ii) are such common-place observations that they do not to require further illustration here. (20iii) is also a well-known fact, but some illustration is in order. As observed by Fodor-Sag (1982), BNQPs have sometimes a quasi-referential interpretation, whereby they act as if they were directly-referring expressions in taking widest scope in the sentence:

(21) a. Every professor overheard the rumor that two students had been called before the Dean
b. Every detective identified two victims that three crimes had ruined
c. If two friends of mine had died in the fire, I would have inherited a fortune

In all the examples above (from Fodor-Sag 1982 and Schein 1993, with modifications), the (underlined) BNQP lies inside a Strong Island (Complex-NP, relative clause and *If*-Clause, respectively), and yet can be construed as taking widest scope. Pesetsky (1987) points out that these data are incompatible with an account of the scopal properties of BNQPs in terms of LF-movement, since BNQPs appear to defy constraints that syntactic movement never can. Pesetsky insightfully suggests that this behavior can be accounted for by postulating not movement, but binding by a covert operator taking sentential scope. The crucial notion, for Pesetsky, is D-linking: the presupposition that the individuals denoted by the wide-scope indefinite are part of a set of individuals whose existence is assumed in the discourse.

I will follow the essence of Pesetsky's proposal, and assume that BNQPs have the option of taking 'virtual' scope from being bound by a sentential-scope quantifier. They do not take wide scope by movement (like DUQPs), nor have scope by themselves (like MNQPs): instead, the scope of their binder is perceived as their scope. So, they effectively take scope wherever their binder does. If this can be maintained, (iii) is accounted for.

As noted by Pesetsky, the behavior of BNQPs is radically different from that of DUQPs, and supports the distinction between scope by movement (QR) for DUQPs and virtual scope (by binding) for BNQPs. The scope of DUQPs, in fact, is constrained (as movement is) by island constraints. The following illustration is from Pesetsky (1987:103):

(22) * If John comes upon every donkey at the zoo, Mary tries to hide it

I will propose the following account:

(23) a. the nature of the binder:
a wide-scope BNQP is bound by an existential closure operator ranging over sets;

b. the site of the binder:
existential closure operators binding wide-scope BNQPs sit at the CP level.

As proposed by Heim (1982), indefinites represent novel information. When not in the scope of another quantifier, they are bound by existential closure. I will assume that a wide scope BNQP is a 'specific' indefinite, in the sense of Enç (1991): an NP is specific if its referent is a subset of a referent which is already in the domain of discourse. The existential binder of a specific indefinite is introduced to 'accommodate' its existential presupposition. Under a specific reading, a BNQP receives existential closure at the sentential level (CP), and accordingly takes sentential scope.

The existential closure operator is in some cases an unselective binder, in other cases a selective binder. The first possibility (unselective) will be related below to the independent construal of two (or more) BNQPs occurring as arguments: in particular, to what I called (in section 2) the independent reading [IND] of (5) above, repeated here:

(5) Two students passed four classes

Under the [IND] construal, both BNQPs are understood as specific. Selective binding is needed for the cases where one of the two (or more) BNQPs is construed as taking a-symmetric scope over the other(s), receiving a specific interpretation: for example, in the other two readings of (5), [S>O] and [O>S]. This will be also discussed below. Although this theory permits the [O>S] construal of a BNQP, it makes it a (contextually) highly constrained reading. In section 10 I will propose that it in fact entails a (mild) WCO violation.

One important point is still missing for this account to be plausible: if a BNQP gets bound by a sentential scope quantifier, it must be interpreted as a Heimian indefinite, i.e., it must contain a free variable position.

This is by no means a trivial point, and needs to be argued for. If it can be maintained, then (20iii) above is accounted for. In the next couple of sections I will argue for the following claims:

(24) i. The determiner in a BNQP may be interpreted as a cardinality adjective; under this interpretation, the BNQP contains a free (second-order) variable position, available for binding from an existential closure quantifier;
ii. The cardinal interpretation of BNQPs, plus further assumptions about the site of existential closure, derives the descriptive generalizations in (20);
iii. When the determiner in a BNQP is not interpretable as a cardinality predicate, the BNQP does not have the scopal properties described in (20) above;
iv. MNQPs are not interpreted as cardinality predicates, and do not contain a free variable position that can allow binding by an existential closure operator; hence they conform not to the generalizations in (20) but to the one in (10), i.e., take scope *in situ*.

The next section will be devoted to showing (24i) and (24ii).

6. BNQPs as Cardinality Predicates

Milsark (1977) and others have argued that weak determiners are interpreted as cardinality predicates in Definiteness Effect contexts. Weak determiners are *a, some,* and

numeric determiners. They are intersective and symmetric[3] (cf. Barwise-Cooper (1981) and Keenan-Faltz (1985)). Milsark's proposal treats the determiner as an adjective. The adjective is one of cardinality: it denotes the property of being a set with (at least) *n* members. It is a property that applies only to sets, not to individuals: in logical terms, a second-order property. The cardinal interpretation of *four* assigns the following logical form to the sentence below:

(25) a. Four men entered the room

a'. $\exists X\ [4(X) \wedge \forall x \in X\ (\text{student}(x) \wedge \text{entered the room}(x))]$
There is a set X, whose cardinality is four, and for every member x of X, x is a student and x entered the room

Strong determiners (=determiners that are not weak) are not amenable to this treatment, for two reasons: some, like *every* and *each* simply don't express information about size. With others, like *most*, the size is not defined absolutely, but varies depending on the set over which the determiner ranges. Such determiners are proportional:

(26) a. Most Nobel-prize winners entered the room

b. Most students entered the room

The size of *most Nobel prize winners* is surely smaller than the size of *most students*. The logical form in (25a') does not offer a correct translation scheme for either (26a) or (26b). For the correct truth definitions to be stated, *most* + N must be defined as a Generalized Quantifier, i.e., as a quantifier restricted to bind first-order variables ranging over the set denoted by the nominal (cf. Schein 1993:Ch.5):

(26) a'. most x [Nobel-prize winner(x)] [entered the room(x)]
for most x in the set of Nobel-prize winners, x entered the room

b'. most x [student(x)] [entered the room(x)]
for most x in the set of students, x entered the room

This line of reasoning forces a distinction between two readings of determiners like *few* or *many* (cf. Partee 1988): a proportional-quantificational (and strong) one, and a cardinal (and weak) one, whereby they mean "a small/large number," contextually defined. With individual-level predicates the proportional reading is prominent. For example:

(27) a. Few linguists are tall

has a quantificational reading wherein *few* is restricted to *linguists*, and the meaning is "few with respect to the total number of linguists." This proportional (quantificational) interpretation does not survive when the QP *few linguists* is embedded in an Existential-There (ET) context. Only the cardinal does:

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[3] Seen as a function that assigns True or False to a sentence depending on the properties denoted by the Common Noun (CN) it modifies and the VP , a determiner is intersective if the truth or falsity of the sentence depends only on the intersection of the CN- and VP-properties. A determiner is symmetric when it yields Truth of the ordered pair <CN-property, VP-property> iff it yields Truth of the pair <VP-property, CN-property>.

(28) There are few linguists at this conference
a. *the number of linguists that are at this conference is small (with respect to the total number of participants or the total number of linguists in the world)*
b. * *the linguists at this conference are few (with respect to the total number of linguists in the world)*

The conclusion that occurrence in ET contexts always forces the cardinal reading is however unwarranted. As pointed out by Schein (1993) and Ben-Shalom (1993), non-increasing weak determiners cannot straightforwardly be interpreted as cardinality predicates, lest their truth conditions be stated incorrectly. To see this, consider the following situation. If we know that eight students are in the room, it would be false to say:

(29) There are fewer than six students in the room

The claim that there is a set whose cardinality is less than six is compatible with there being a bigger set, too, but the sentence really means that the cardinality of the set cannot be six or greater. While the sentence in (29) is false in the situation we are considering, a formula containing a cardinality predicate turns out true:

(30) $\exists X\ [|X| < 6 \wedge \forall x \in X\ (\text{student}(x) \wedge \text{in the room}(x))]$

I will refer to this peculiarity of non-increasing QPs as their "maximality" property.

Another argument that ET contexts do not select for QPs whose determiner has a cardinal interpretation, but for weak/intersective determiners, as in Keenan-Faltz (1985), Barwise-Cooper (1981) and others, is offered by Herburger (1993). She points out that a sentence like:

(31) Few INCOMPETENT cooks applied

has what she calls a focus-proportional (*f-p*) interpretation. In this reading, the focused predicate (incompetent) is mapped to the nuclear scope of the quantifier as the clause main predicate, while the S-Structure VP is added to the nominal portion of the QP to form the restrictor of the quantifier. In other words, the logical translation is as follows:

(32) Few x [cook(x) $\wedge$ applied(x)] [INCOMPETENT(x)]
few of the cooks that applied were incompetent

The f-p reading is a proportional, and quantificational (non-cardinal) reading. Yet it is possible in ET contexts:

(33) a. There applied few Spanish citizens THAT WERE NATIVE SPEAKERS OF BASQUE
b. There applied few native speakers of Basque THAT WERE SPANISH CITIZENS

Another relevant observation of Herburger's is that f-p NPs do not take wide scope over a c-commanding QP:

(34) Every teacher in this school flunks few RICH kids [under f-p construal]
a'. *every teacher is such that few of the kids (s)he flunks are rich*
b'. **few of the kids that are such that every teacher flunks them are rich*

In sum, the fact that my proposal is not fully consonant with Milsark's is not a problem. There are independent reasons to handle ET contexts somewhat differently than he did, and these latter are compatible with my proposal.

Modifying the logical scheme in (25a') to allow proportional and non-increasing readings of indefinite determiners to be treated as cardinality adjectives might be possible, but surely requires considerable (ad hoc) complications in logical form. The discussion in this section thus supports the following conclusions:

(35) i. From a semantic point of view, the bare-numeral determiners that form BNQPs, being all intersective and increasing, lend themselves in a natural way to be treated as cardinality predicates.

ii. A determiner like *many*, which although increasing exhibits both proportional and a non-proportional readings, can receive a cardinal interpretation only when used in the latter; in its proportional interpretation, it should be interpreted as forming a Generalized Quantifier, according to the scheme in (26a'/b').

iii. *Few,* being a decreasing determiner, should be interpreted according to the 'quantificational' scheme (26a'/b').

I'll follow the recommendation in (35i) and treat BNQPs as incorporating a cardinality predicate and a second-order variable that can be bound by a quantifier which provides its 'virtual' scope, as explained in the previous section.

I have so far provided some support for point (35i) at the end of section 5: the determiner of a BNQP can be interpreted as a cardinality predicate. I have also shown that the descriptive generalization in (20iii), i.e., the 'absolute scopal independence' of BNQPs can be derived through the binding mechanism outlined above (in principle at least, since the procedure has not yet been illustrated in sufficient detail, something that will be done in section 9).

7. Referentially Dependent BNQPs

I need now, in order to corroborate point (35ii), to show that interpreting the determiners in BNQPs as cardinality predicates allows us to derive also the generalizations in (20i-ii), i.e., the scopal dependence of BNQPs.

The scope position of a BNQP is determined by the site of its binder. To account for referentially dependent BNQPs, we simply have to insure that their existential closure (the only type of quantifier needed to account for referentially dependent BNQPs) occurs inside the scope of the wide scope quantifier.

Since I have explicitly abandoned May's Scope Principle, an alternative mechanism must be specified. One possibility is to assume that the relevant criterion for determining what is referentially dependent is specificity: BNQPs that are specific are always existentially closed at the sentential (CP) level, and hence are never referentially dependent, since they take widest scope; referentially dependent BNQPs instead receive existential closure locally (i.e., subjects at the IP level, objects at the VP level). These assumptions, in conjunction with the implementation of 'virtual scope' suggested in section 5, yield scopally unambiguous LFs, making the Scope Principle trivial to state. Scope is read off the left-to-right order of the quantifiers at LF.

I will illustrate a couple of cases. Consider the classic examples:

(36) a. Every woman loves two men

b. Two women love every man

If the object BNQP in (a) denotes a specific (unique) set, then it takes CP scope, which means, wide scope over the IP-adjoined (by QR) universal NP. This derives the [O>S] reading. Otherwise it will take local scope and be existentially closed at the VP level, yielding the [S>O] reading. In (b), if the binder of the BNQP sits at the CP level because it is specific, it takes scope over the universal [S>O]; otherwise, it will sit at the IP level, but then the object DUQP will adjoin to its left (because of the ECP; cf. May 1985), and take wide scope, deriving the [O>S] reading.

This concludes my discussion of point (35ii) above, which derives the generalizations on the scope of BNQPs, as listed in (20). In the next section, I will support the last two points, (35iii) and (35iv), pertaining to indefinite determiners that are not interpreted as cardinality predicates.

8. MNQPs and Focused-Numeral BNQPs

If claim (35iv) of section 5, i.e., that MNQPs are not interpreted as cardinality predicates, but rather as Generalized Quantifiers, can be supported, the scope behavior of MNQPs is predicted. Being interpreted as quantifiers, they do not contain a free variable, therefore cannot use the virtual scope option as BNQPs do. Since I proscribe LF-movement for non-DUQPs, it follows that they must take scope *in situ*.

That MNQPs receive a quantificational interpretation is first of all suggested by the presence of Weak Cross-Over effects (WCO). Given the assumptions made in the present paper, I will not strictly take the definition of this (poorly understood) phenomenon to be the situation where an A'-bound pronominal in A-position locally c-commands a co-indexed variable. In particular, I will not take WCO to be a diagnostic of LF-movement on the part of the QP. Rather, I will maintain a less committal position, and (descriptively) assign the effect to an LF configuration where the position occupied by an NP interpreted as a quantifier lies to the right of a pronominal element it binds. I therefore take WCO as a diagnostic of the quantificational status of the NP. Although the WCO test can only be applied to some MNQPs, i.e., those that are morphologically singular, the results indicate that MNQPs produce degradation comparable to that of a true quantifier like *every* in WCO configurations:

(37) a. ?? His_1 boss hates everyone_1
b. ?? His_1 boss hates at most one employee_1
c. ?? His_1 boss hates at least one employee_1

(38) a. ?? Its_1 painter gave every landscape_1 to five collectors
b. ?? Its_1 painter gave more than one landscape_1 to five collectors
c. ?? Its_1 painter gave at most one landscape_1 to five collectors

For most members of the MNQP class, the claim that they are interpreted only as Generalized Quantifiers follows from the maximality condition, given the discussion in the previous section. Most of the determiners that build MNQPs are either decreasing or non-monotone, hence they don't lend themselves to be interpreted as cardinality predicates, if we want to use the very same scheme as BNQPs use. Economy/simplicity considerations ruling out having distinct schemes of translation for items of the same type, only the Generalized Quantifier option is available.

But as noted, there are determiners that build increasing MNQPs, such as *more than five, at least five.* Still, these have the same scope properties of the other (non-increasing) MNQPs, and take scope *in situ*. The remainder of this section is devoted to presenting an argument that increasing MNQPs are only interpreted as Generalized Quantifiers because their syntactic (LF) structure over-rides monotonicity considerations.

Some evidence that even increasing MNQPs are interpreted as quantifiers is provided by the phenomenon of numeral-focusing in BNQPs. Focusing of the numeral applies to BNQPs (weak QPs with cardinal readings) and turns them into quantifiers, eliminating their cardinal interpretation. It is easy to see this. Consider:

(39) a. FOUR students entered the room
b. John passed FOUR classes

I'll call this the focused-numeral reading (*f-n* for short). The meaning of (39a) can be paraphrased as: "the number of students who entered the room is (exactly) four." Similarly, (39b) reads: "the number of classes that John passed is (exactly) four." The presence of the "exactly" part is highlighted when we consider that (39a/b) are most naturally used in contexts such as: "FOUR students entered the room, not five as you say," or "You are wrong. John passed FOUR classes, not six." Under f-n, the bare-numeral determiner is no longer increasing, but non-monotone. As such, it is subjected to the maximality condition: if actually six students had entered the room, it would be false to say (39a). Consequently, the (focused) determiner cannot be interpreted as a cardinality predicate. The logical translation of (39a) can no longer be (40a), but only (40b):

(40) a. $*\exists X\ [4(X) \wedge \forall x \in X\ (\text{student}(x) \wedge \text{entered the room}(x))]$
b. exactly-four x [student(x)] [entered the room(x)]

When f-n is applied to them, BNQPs do not behave scopally like normal BNQPs: rather, they have the same scope properties as MNQPs. This was briefly mentioned in the Introduction, but is worth illustrating explicitly, since it provides important evidence for the proposals in this paper. Consider the following sentence, where f-n has applied to the object BNQP:

(41) Two student passed FOUR classes

This sentence has the same scope readings as (6), which contains an MNQP in object position. (41) has, in other words, the same scope readings as:

(42) Two students passed exactly four classes / fewer than six classes

Crucially, it does not have the [O>S] nor the [IND] readings. F-n, then, turns a BNQP into an MNQP-like QP.

F-n does not appear to be available for modified-numeral QPs. The relevant observation is that MNQPs do not lose or acquire readings when the modifier+numeral part is focused. This holds not only for non-increasing MNQPs but for increasing ones as well:

(43) a. AT LEAST FOUR students entered the room
b. At least four students entered the room

As the reader can verify, (a) has the same reading as (b). If indeed all MNQPs are interpreted only as quantifiers and not also as cardinality predicates (when they are increasing), this effect is derived automatically.

Data from Hungarian suggest a similar conclusion. As is well-known, Hungarian has special S-Structure positions for QPs (cf. e.g., Kiss 1991). Thus it is interesting to ask whether increasing MNQPs have the same distribution as BNQPs without a focused numeral, or the same distribution as DUQPs and non-increasing MNQPs. A. Szabolcsi (p.c.) points out to me that the latter is the case. *Legalább két ember* 'at least two men' patterns with strong quantifiers, and *háromnál több ember* 'more than three men' patterns with decreasing MNQPs. This suggests that although semantically their determiners might be treated as cardinality predicates, syntactically they fall together with first order quantifiers.

In conclusion: the phenomenon of f-n shows that, when the determiner is not interpretable as cardinality predicate, BNQPs take scope in situ, like true quantifiers other than universals (cf. (35iii) of section 5); f-n with MNQPs and quantifier positions in Hungarian suggest that all MNQPs, including the increasing ones, are not interpreted as cardinality predicates, but as quantifiers at LF.

9. Indefinites in Subject and Object Positions: A Summary

To directly illustrate and summarize the proposals so far, in this section I will provide sample derivations for the readings assigned to our basic data: simple transitive sentences with BNQPs and MNQPs in subject and object position. Consider first (5). All three scope readings are derivable as indicated above:

(5) two students passed four classes

[S>O]. $[_{CP}\ \exists_X\ [_{IP}$ two students$_X$ $[_{VP}\ \exists_Y$ [passed [four classes$_Y$]]]]

[O>S]. $[_{CP}\ \exists_Y\ [_{IP}\ \exists_X\ [_{IP}$ two students$_X$ [passed [four classes$_Y$]]]]

[IND]. $[_{CP}\ \exists_{X,Y}\ [_{IP}$ two students$_X$ $[_{VP}$ passed [four classes$_Y$]]]]

Turning now to (6), only the S>O reading can be generated, since the MNQP does not move, and cannot be bound by an existential closure operator since it is a quantifier.

(6) two students passed fewer than six classes

[S>O]. $[_{CP}\ \exists_X\ [_{IP}$ two students$_X$ $[_{VP}$ passed [fewer than six classes]]]]

In (7), the S>O is derived by taking the object BNQP to be a cardinality predicate, and letting it distribute over the range of the MNQP quantifier:

(7) fewer than six students passed four classes

[S>O]. $[_{IP}$ fewer than six student $[_{VP}\ \exists_Y$ [passed [four classes$_Y$]]]

The [O>S] is obtained by virtual scope of the object BNQP:

[O>S]. $[_{CP}\ \exists_Y\ [_{IP}$ fewer than six students [passed [four classes$_Y$]]]]

10. Weak Cross-over: The Unnaturalness of O>S

In this section, I will fine-tune the proposal by deriving the unnaturalness of the [O>S]:

(5) two students passed four classes

?[O>S]. $[\exists Y\ [_{IP}\ \exists X$ [two students$_X$ [passed [four classes$_Y$]]]

there are four classes, that were each passed by two (different) students

The wide scope object BNQP, being bound by sentence level existential closure, denotes a unique set of individuals. In the fully distributive interpretations that we have been considering in this paper, the referentially dependent QP (here the subject) does not denote a unique set, but six (possibly disjoint) sets of two students each. The reference of the subject (the two students) is chosen as a function of the object (each class).

We can encode scope-dependency by adding to the referential index of the dependent QP the index of the QP it depends on. This has been proposed by Haik (1984), who calls it 'indirect binding.' Slash indexation simply provides a way to represent referential dependency. Adopting Haik's proposal, we can add to the LF of (5) above a '/Y' to the index X.

The assumption I will make is that the slash index is interpreted as a pronominal element. The awkwardness of the O>S reading finds then a straightforward explanation in terms of WCO. The situation in the O>S of (5) is, in fact, analogous to classic WCO:

(44) a. ? His_1 mother loves every student_1
for every y, y a student, f(y) loves y, where f(y)=the mother of y

(5) [O>S] *There is a set X, such that for every x, x one of four classes, f(x) passed x, where f(x)=the two students who passed x*

In the classic case of WCO, the quantifier (*every student*) is preceded by an overt pronoun bound by it; in the case of (5) considered here, there is a covert one. Under the S>O construal of (5), no WCO arises, since the slash index remains to the right of the quantifier:

(5) [S>O]. $[\exists X\ [\text{two students}_X\ [\exists_{Y/X}\ [\text{passed}\ [\text{four classes}_{Y/X})]]]]$

The effect shows some variability, which is not unusual for WCO. It appears to be stronger when the object taking wide scope over a BNQP subject is itself a BNQP than when the object is a DUQP. But the fact remains that the [O>S] is usually perceived as less natural then the [S>O], and WCO offers an explanation for it.

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