Quantifier Lowering?
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I. Quantifier Lowering: Some History

1. Some politician is likely to address John’s constituency  
   May (1977)
2. "[1] may be taken as asserting either (i) that there is a politician, e.g., Rockefeller, who  
   is likely to address John’s constituency, or (ii) that it is likely that there is some politician  
   (or other) who will address John’s constituency."
3. Many people were thought to have sold IBM shares
4. May gives no explication or paraphrases, but (3) does seem to have both kinds of  
   readings that May indicates for (1).
5. Everyone seems to like Cecil's playing
6. May again gives no explication. This time the differences are harder to pin down.
7. "... the reason that sentences like [(1), (3), (5)], containing raising predicates, are  
   ambiguous is that they can be associated with two distinct logical forms ..."  
   p.189
8. $[s [some politician] \alpha [s t to address John's constituency] \ ] \ ]$
9. This one arises from a standard raising instance of May's Quantifier Rule (QR).
10. $[s \alpha is likely [s [some politician] t to address John's constituency] \ ] \ ]$
11. We get this one from a lowering instance of QR, as QR "applies freely".
12. " In [(8)] and [(10)] 'e' and 't' represent occurrences of the same variable, since they both  
   arise from movement of the same noun phrase; hence they are both bound by this  
   phrase."  
   p.192
13. "In [(8)], the quantifier 'some' has scope wider than the matrix predicate 'likely'; it  
   corresponds to the (i) reading of this sentence as described above. In [(10)], on the other  
   hand, the quantifier has scope narrower than 'likely'; this logical form corresponds to the  
   (ii) reading above."
14. Finally, in effect, \( \alpha \) in (10) can be ignored as it is not an argument position.
15. A hippogryph is likely to be apprehended  
   May (1985)
16. "On [one] interpretation, [(15)] can be truthfully uttered without any supposition  
   regarding the existence of hippogryphs. This contrasts with another construal under  
   which it could not be truthfully uttered without this supposition."  
   pp.97-98
17. "LF-movements are instances of 'Move \( \alpha \)', and thus ... their application is free, in the  
   sense that derivationally a moved phrase may be adjoined to any S node. In particular,
there is nothing to prevent the derivation of (23b) alongside (23a); the former is derived by 'raising' the S-Structure matrix subject to the matrix S, the latter by 'lowering' it to the complement S:

(23)a. a hippogryph₂ [e₂ is likely [e₂ to be apprehended]]
   b. e₂ is likely [a hippogryph₂ [e₂ to be apprehended]]

It is apparent that the structures in (23) represent the relevant ambiguity, at least as far as scope of quantification is concerned. In (23a) the quantified phrase stands outside the scope of the matrix predicate likely; in (23b) it is inside the predicate's scope.

(18) Finally, the matrix e₂ in (23a) is an expletive, while the embedded e₂, being locally A-bound by an operator, is a variable.

II. QL: Some Alternative Treatments

(19) Sauerland and Elbourne (2002) suggest another sort of account of the phenomenon of Quantifier Lowering:

(20) [An Austrian] i is likely to t₁ win the gold medal.

(21) "The analysis of the narrow scope interpretation of [(20)] we argue for is that an Austrian undergoes movement from the trace position t₁, but that this movement operation is purely phonological and therefore does not affect interpretation." p.286 This is a PF analogue of the LF movement widely assumed in Principles and Parameters theorizing.

(22) Sloan and Uriagereka (1988) suggest yet another interestingly different account of the phenomenon. Rather than having a lowering operation largely undoing the effects of raising, or a movement with no semantic effect, they propose, roughly in the spirit of Lasnik (1972), that quantifier scope is determined cyclically, but as part of the syntactic cycle, not as part of a later LF cycle. This is an obvious precursor of the multiple spell-out of Uriagereka (1999).

III. The Empirical Difficulty: QL is much less general than it is expected to be.

(23) None of these accounts predicts any limitation on lowered interpretations. Whenever there is a raising construction, 'lowered' readings should be possible. But, as first observed by Partee (1971), and as I discussed in Lasnik (1998) and Lasnik (1999) among other places, such readings are very often unavailable, as indicated by the standard test of paraphrase by the it ... [finite clause] alternant. Below, I provide a sampling of examples from those works, as well as some new ones, and some brief discussion. (I use ≠ to indicate that the first example cannot be paraphrased by the second.)

(24) a. Nobody is (absolutely) certain to pass the test ≠
   b. It is (absolutely) certain that nobody will pass the test Partee (1971)

(25) a. No large Mersenne number was proven to be prime ≠
   b. It was proven that no large Mersenne number is prime

(26) a. Noone is certain to solve the problem ≠
   b. It is certain that noone will solve the problem
(27)  a. Every coin is 50% likely to land heads
   b. It is 50% likely that every coin will land heads

(28)  a. Every coin is 3% likely to land heads
   b. It is 3% likely that every coin will land heads

(29)  In (28), if we have 5 coins, the b. reading (i.e., the lowered one) would be far more plausible. Yet it is unavailable.

(30)  However, Boeckx (2001) argues that unlike likely, 3% likely is not a raising predicate. Then the only source for (28)a would be control, and lowering is not expected with a control structure.

(31)  *There is 30% [sic] likely to be a man in the garden

(32)  In fact, a number of my consultants agree with Boeckx's judgment on (31). But not all of them do. Yet none of them get the lowered reading for (28)a.

(33)  Some examples like (28), but where many speakers (in fact, nearly all of my consultants) clearly allow raising:

(34)  a. Every student is quite likely to pass the exam
   b. It is quite likely that every student will pass the exam

(35)  a. There is quite likely to be an investigation
   b. The cat is quite likely to be out of the bag

(36)  a. Everyone is fairly certain to pass the exam
   b. It is fairly certain that everyone will pass the exam

(37)  a. There is fairly certain to be a storm today
   b. The shit is fairly certain to hit the fan (when this news breaks)

(38)  Another possible failure of 'lowering' comes from an observation about scope that Zubizarreta (1982) attributes to Chomsky, and that is discussed again by Chomsky (1995):

(39)  a. (it seems that) everyone isn't there yet
   b. everyone seems [t not to be there yet]

(40)  Chomsky (p.327) argues as follows: "Negation can have wide scope over the Q in [(39)a]... but not in [(39)b]", concluding that "...reconstruction in the A-chain does not take place, so it appears."

(41)  I expected [everyone not to be there yet]

(42)  This kind of example might still be compatible with May style literal lowering (as in fact Chomsky suggests), but would still be incompatible with purely PF raising or with activation of a lower copy in a movement chain (a point that Chomsky makes).

IV. Towards a Theory?

(43)  A theory of what?

(44)  QL exists, as it would under any of the accounts above. Then we need an account of why it is so often blocked (basically, with anything except indefinites).
(45) QL doesn't exist. Then we need an account of why it doesn't. And we also need an
account of why it looks like it does with indefinites.

(46) In some of my earlier work referenced above, I proposed that A-movement, unlike A-
movement, doesn't leave a trace/copy. Then classic literal lowering would leave the Q
with no variable to bind. And copy activation would obviously be impossible, there being
no copy.

(47) As for the indefinites, I noted two things. First, in the standard examples, even though
there do seem to be two readings, it is very difficult to separate them in terms of truth
conditions. On the other hand, in the negative and universal examples, where lowering
fails, the two sets of truth conditions for each example are relatively easy to distinguish.

(48) Second, I appealed (vaguely) to known special properties of indefinites that might
provide two readings without an actual scope difference - for example, the specific/non-
specific ambiguity discussed in detail by Fodor and Sag (1982).

(49) What of the classic 'trapping' effects (as in May (1985) and Lebeaux (1998))? 

(50) a. No agenti was believed by hisi superior to be a spy for the other side ∗ 
b. *It was believed by hisi superior that no agenti was a spy for the other side

(51) There are two interfering factors here: Negatives don't lower in the first place; and, even
controlling for that, what can we really conclude from the fact that a particular sentence
cannot be paraphrased by an ungrammatical sentence (one violating weak crossover):

(52) a. Some agenti was believed by hisi superior to be a spy for the other side ∗
b. *It was believed by hisi superior that some agenti was a spy for the other side

(53) However, Wurmbrand and Bobaljik (1999) justifiably observe, with respect to (48), that
while that might allow us to explain apparent wider than expected scope, it can't possibly
tell us anything about narrower than expected scope.

(54) Someone seems [ to love everyone ] ∀ can scope over ∃

(55) Someone wants [ PRO to kiss everyone] ?∀ cannot scope over ∃

(56) Note that for the issue at hand, it does not suffice to show that ∀ can scope over ∃.
Rather, it must also be true that seem scopes over both of them. I am willing to believe
that that is true, but I am not certain. The following example is relevant:

(57) Two women seem to each other to be expected to dance with every senator

(58) 2 must be high (to license each other). ∀ cannot scope over 2. Thus, it is reasonable to
conclude that in (54) also, the scope of ∀ is limited to the embedded clause, and hence
that the scope of ∃ is the lower clause.

(59) Someone, seemed to his, boss to be reviewing every report ∀ cannot scope over ∃
Two of the students in the room are (almost/virtually) certain to have the same birthday
[Suppose there are 60 students in the room. The low reading has rather clear truth
conditions, and they are satisfied.]

V. A New Approach (one excluding lowering in general, but allowing genuine low scope
where it does seem to exist).

Recall the Sloan and Uriagereka (1988) approach to lowering phenomena, one that fits
neatly into single cycle syntax.

And suppose that scope is generally achieved via QR, where QR is always an Ā raising
operation.

Then, to get embedded scope QR would have to operate on the embedded cycle.

But then subsequent raising to matrix subject position would constitute an instance of
'improper movement' from Ā-position to A-position.

Matrix scope would cause no such problem. Its derivation would involve perfectly
standard A-movement (raising) followed by Ā-movement (QR).

But what of the low readings of indefinites in raising constructions?

For these we can rely on another special property of indefinites (that Mamoru Saito
reminded me of): that they are, or can be, variables rather than quantifiers, an idea
developed by Heim (1982).

These variables are then provided with binders by existential closure.

Following Reinhart (1997) among others, I would take existential closure to be available
in all clausal domains, not just the matrix.

If closure is introduced in the lower clause in the examples at issue, we get low scope.
And no constraint on improper movement would prevent subsequent A-movement of the
indefinite up to subject position of the higher clause (though the raising would be
semantically vacuous, rather in the spirit of Sauerland and Elbourne (2002)).

An alternative derivation would have raising, then closure in the higher clause. This gives
high scope.

The Lebeaux and Hornstein examples with high binding and no possibility of low scope
fall out, as low scope implicates low closure. But then the high pronoun or variable could
not be in the scope of the introduced existential.

One remaining task: Develop a principled theory of improper movement that would be
effective here. As far as I know, noone has yet claimed that improper movement might
block raising of the subject of a raising complement.
References


Sloan, Kelly and Juan Uriagereka. 1988. What does 'everyone' have scope over? GLOW. Budapest.

