

A Surprising Consequence of Single Cycle Syntax

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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) $[_S \text{ [some politician]}_{\alpha} [_S \alpha \text{ is likely } [_S t \text{ to address John's constituency}]]]$
- (9) This one arises from a standard raising instance of May's Quantifier Rule (QR).
- (10) $[_S \alpha \text{ is likely } [_S \text{ [some politician]}_{\alpha} [_S t \text{ to address John's constituency}]]]$
- (11) We get this one from a lowering instance of QR, as QR "applies freely".
- (12) " In [(8)] and [(10)] ' α ' 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, α 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 α ,' 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 [e_2 is likely [e_2 to be apprehended]]
 b. e_2 is likely [a hippogryph₂ [e_2 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." p.99
- (18) Finally, the matrix e_2 in May's (23a) is an expletive, while the embedded e_2 , being locally \bar{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 t_i 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 t , 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), which shortly led to single-cycle syntax..

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 \neq 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% likely to be a man in the garden p.541
- (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).
- OR
- (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 \bar{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) Note that in the negative and universal examples, where lowering fails, the two sets of truth conditions for each example are relatively easy to distinguish.
- (48) As for the indefinites, I noted that in the standard examples, even though there is the strong feeling of two uses or readings, it is very difficult to separate them in terms of truth conditions.
- (49) Recall again May's classic example:
- (50) Some politician is likely to address John's constituency
- (51) Possibly on the first reading, the speaker has a particular individual in mind (a politician, in this instance), but, for some discourse reason or other, does not identify that individual. On the second reading (the 'lowered' one), the speaker does not have any particular individual in mind. But if that's what's at issue, it is hard to conclude that we are dealing with a syntactic scope changing operation.
- (52) Some politician addressed John's constituency
- a. ...namely Rockefeller
 - b. ...I can tell by all the balloons and flags on the green
- (53) Someone is likely to clean the blackboard
- (54) Someone cleaned the blackboard
- a. ...namely, Joe the maintenance man
 - b. ...I have no idea who, but the board was covered with phrase structure trees last night, and is now bare
- (55) There are examples in the literature specifically intended to highlight the semantic difference between lowered and non-lowered readings. One famous example is due to Fox (1999):

- (56) Someone from New York is very likely t to win the lottery
- (57) “One interpretation results when the quantifier takes scope in the final landing site. For the sentence to be true under this interpretation, there must be a person from New York who is very likely to win the lottery (e.g., a person who bought enough tickets to make winning a likely outcome). Under the second interpretation, in which the quantifier has scope in the position of *t*, the truth conditions are much less demanding; they merely require that there be enough ticket buyers from New York to make it likely that the city would yield a winner.” [p.160]
- (58) As is so often the case, the discussion suggests that one of the readings entails the other. That also seemed to be true in May’s discussion of his hippogryph example, (15) above. I put that matter aside.
- (59) Now consider strengthening the situation in Fox’ example, changing likelihood to certainty:
- (60) Someone from New York is certain t to win the lottery
- (61) Imagine that a particular New Yorker bought **all** the tickets. Or, alternatively, imagine that only New Yorkers bought tickets. (60) is a good description of either situation, parallel to what was seen with the Fox example. And, as in that example, it is tempting to implement the second reading via lowering, with *someone from New York* below *certain* at LF.
- (62) But now imagine the exact same pair of situations concerning ticket purchasers (and the speaker's knowledge thereof). And suppose the drawing has taken place, but the winner has not yet been announced. Suppose the speaker were to utter (63).
- (63) Someone from New York won the lottery
- (64) It seems to me that (63) could be an accurate and felicitous report of **either** situation, just as in the case of Fox’s (56) or my modification in (60).
- (65) For (56) and (60), the standard story about the situation where most/all of the tickets were bought by New Yorkers has *someone* lowering to a position below *likely/certain* (or else a low copy being activated). But (63) is a completely transparent extensional context. If the 'lowered reading' is to be instantiated by lowering of *someone*, what operator does that expression lower below?
- (66) 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: .9941 probability.]

On the other hand, suppose there are 367 students in the room:

- (67) Two of the students in the room have the same birthday

- (68) What of the classic 'trapping' effects (as in May (1985) and Lebeaux (1998))?
- (69) a. No agent_i was believed by his_i superior to be a spy for the other side ≠
 b. *It was believed by his_i superior that no agent_i was a spy for the other side May (1985)
- (70) There are two interfering factors here: Negatives don't lower in the first place, Partee's observation; 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):
- (71) a. Some agent_i was believed by his_i superior to be a spy for the other side ≠
 b. *It was believed by his_i superior that some agent_i was a spy for the other side
- (72) Some professor_i is believed by his_i students to be a tyrant
 a. Howard Lasnik is believed by his students to be a tyrant
 b. Some professor (or other), I have no idea exactly who, is believed by his students to be a tyrant
- (73) The context for (60)b might be the discovery of graffiti scrawled on the lavatory wall saying "Our professor is a tyrant".

Another kind of trapping effect, also due to Fox (1999):

- (74) a. [A student of David_i's] seems to him_i to be at the party
 b. [A student of his_i] seems to David_i to be at the party
- (75) Fox reports that in (74)a, there is no lowered reading (i.e., where the surface subject takes scope under *seem*). In (74)b, on the other hand, the reading is reported to exist.
- (76) In the former example, but not the latter, lowering of the subject would put *David* in the c-command domain of *him*, thus triggering a Condition C violation. And in this instance, a paraphrase might potentially be as in (77).
- (77) It seems to David_i that a student of his_i is at the party

The logic of the argument seems exactly correct, but I have to confess that I have no clear judgments. I am willing to believe that Fox is right, but I just can't tell. I am even less sure that (74)a contrasts with (78), where the pronoun is embedded in a larger NP, in the predicted way (with the lowered reading available in the latter, since *his* would not c-command out of *his colleague*).

- (78) [A student of David_i's] seems to [his_i colleague] to be at the party
- (79) So what's going on with indefinites?
- (80) In earlier work 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).

- (81) However, Wurmbrand and Bobaljik (1999) justifiably observe 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.
- (82) Someone seems [*t* to love everyone] \forall can scope over \exists Aoun and Li (1993)
- (83) Someone wants [PRO to kiss everyone] \forall cannot scope over \exists
- (84) Note that for the issue at hand, it does not suffice to show that \forall can scope over \exists . 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:
- (85) Two women seem to each other to be expected to dance with every senator Lebeaux (1998)
- (86) *Two women* must be high (to license *each other*). \forall cannot scope over *Two women*. Thus, it is reasonable to conclude that in (82) also, the scope of \forall is limited to the embedded clause, and hence that the scope of \exists is the lower clause.
- (87) The idea is that raising of the predicate *seem* (instead of lowering of the subject) couldn't explain why there is no lowered reading in (85). [May (1985) had already made exactly the same point about a similar example.]
- (88) Of course, the classic test for lowering once again cannot really be run. If paraphrase by *It ... S* is the test (and it is the one standardly offered) definitely lowering fails:
- (89) *It seems to each other that two women are expected to dance with every senator
- (90) But the devil is in the *. It is not merely that (85) cannot be paraphrased as (89). **Nothing** can be paraphrased as (89), since (89) is ungrammatical, a difficulty we have seen before.
- (91) Someone_i seemed to his_i boss to be reviewing every report \forall cannot scope over \exists Hornstein (1995)

So I'm still a bit skeptical about QL (or at least about the usual arguments for it), but I will now provisionally assume that it exists (only) for indefinites, and suggest why this might be so.

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

- (92) Recall the Sloan and Uriagereka (1988) approach to lowering phenomena, one that fits neatly into single cycle syntax.
- (93) And suppose that scope is generally achieved via QR, where QR is always an \bar{A} raising operation.

Consider the ('lowering') derivation of Partee's example (24)a, repeated as (94).


- (94) Nobody is (absolutely) certain to pass the test

QR on the embedded clausal cycle would yield something like.

(95) $[_{IP} \text{ nobody } [_{IP} \text{ t to pass the test }]]$

But then subsequent raising to matrix subject position would constitute an instance of 'improper movement' from \bar{A} -position (adjoined to lower IP) to A-position (Spec of matrix IP):

(96) $[_{IP} \text{ ______ is certain } [_{IP} \text{ nobody } [_{IP} \text{ t to pass the test }]]]]$



(97) If there is no separate later LF cycle, to get embedded scope QR would have to operate on the embedded syntactic cycle. But then subsequent raising to matrix subject position would invariably constitute an instance of 'improper movement'.

Matrix scope would cause no such problem. Its derivation would involve perfectly standard A-movement (raising) followed by \bar{A} -movement (QR):

(98) $[_{IP} \text{ nobody } [_{IP} \text{ t is certain } [_{IP} \text{ t to pass the test }]]]]$

(99) But what of the low readings of indefinites in raising constructions, which I am provisionally assuming exist?

(100) 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).

(101) These variables are then provided with binders by existential closure.

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

(103) 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)).

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

(105) 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.

(106) One remaining task: Develop a principled theory of improper movement that would be effective here. As far as I know, no one has claimed before now that improper movement might block raising of the subject of a raising complement.

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