

# An Economy-based Approach to Scope Interaction among QP, Negation and Intensional Predicate\*

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**Park, Jong-Un and Park, Myung-Kwan. (2003). An economy-based approach to scope interaction among QP, negation and intensional predicate. *Language Research* 39(3), 479-505.**

This paper provides an economy-based account for the scope interaction among QP, negation and intensional predicate. First of all, we argue that inverse scope of quantifier phrases either below negation or intensional predicate in raising constructions is attributed to their literal lowering. In particular, focusing on the asymmetry in inverse scope between the two types of Qps, universal and existential QPs, we suggest that the inability of the former universal QPs to take inverse scope below intensional verb is due to the *phase*-bounded locality of their scope-taking movement. By contrast, the inability of the latter existential QPs to take inverse scope below negation is ascribed to *Relativized Minimality* (RM) effects, which can be subsumed under the more general *Weak Island* effects. Second, we extend this line of analysis to scope relations of QPs in object position. The inability of object universal QPs to take wide scope over negation, on the one hand, stems from the same *phase*-bounded locality of their scope-taking movement that subject ones obey. Object existential QPs, however, either take *phase*-bounded movement to an outer [Spec, *v*P] position, thereby taking scope below negation. Or alternatively, they have an option of exploiting the *RM*-circumventing unbounded scope movement, thereby taking wide scope over negation and being interpreted as specific.

**Key words:** phase reconstruction, universal QP, existential QP, quantifier raising, quantifier lowering, weak Island, *relativized minimality*, *shortest move*

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\* We would like to thank Cedric Boeckx, Sungeun Cho, Howard Lasnik and the two anonymous reviewers of this journal for their helpful comments. Partial funding for the work reported here was provided by the Grant from the Brain Korea 21 Project in 2003 (the first author) and by the Overseas Visiting Professor Grant from the Korea Research Foundation under No. 2001-013-A00036 (the second author). The authors' names appear in alphabetical order.

## 1. Introduction

May (1977, 1985) argues in accounting for scope interaction between subject and object QPs that all the QPs undergo covert Quantifier Raising (QR) at LF from Case-assigned positions to scope-taking positions (e.g., IP-adjoining or VP-adjoining positions). The notable thing is that QR in May's original conception applies uniformly to all the QPs irrespective of their type. For example, in (1) both subject and object QPs undergo QR, producing two different LF representations in (1a) and (1b). This accounts for the ambiguous interpretations in (2a) and (2b):

- (1) Some man loves every woman. ( $\exists >> \forall$ ;  $\exists << \forall$ )  
 a. [<sub>TP</sub> some man<sub>i</sub> [<sub>TP</sub> every woman<sub>j</sub> [<sub>TP</sub> x<sub>i</sub> loves y<sub>j</sub>]]].  
 b. [<sub>TP</sub> every woman<sub>j</sub> [<sub>TP</sub> some man<sub>i</sub> [<sub>TP</sub> x<sub>i</sub> loves y<sub>j</sub>]]].
- (2) a. There is a man *x* such that, for every woman *y*, *x* loves *y*.  
 b. For every woman *y*, there is a man *x* such that *x* loves *y*.

In addition to QR, May also postulates another transformational rule, i.e., Quantifier Lowering (QL). This operation performs downward movement of QPs from Case positions to scope positions at LF. Consider the following sentence.

- (3) Some politician is likely to address John's constituency.  
 ( $\exists >> \textit{likely}$ ;  $\exists << \textit{likely}$ )  
 a. There is a politician, e.g., Rockefeller, who is likely to address John's constituency.  
 b. It is likely that there is some politician (or other) who will address John's constituency.

In (3) the subject QP takes scope either over or below the intensional predicate *likely*. Note that, in May's analysis, the inverse scope reading of the former below the latter is attributed to QL of the former from the matrix [Spec, IP] position to the IP-adjoined position in the embedded clause.

However, May's analysis of quantifier scope by assuming that both QR and QL are insensitive to the type of QPs seems to pose nontrivial

problems. As recently argued by Beghelli and Stowell (1997) and Park and Park (2002), it is not the case that all the QPs can undergo QR in the same way. There are at least two kinds of problems with May's uniform analysis for all the QPs, which undermine his account for scope interpretations. We will discuss these two problems one by one shortly.

First, let us note the asymmetry between universal and existential subject QPs in scopal interaction with negation. The following two sets of examples in (4) and (5) make a case for this asymmetry ((4b-d) and (5b-c) are drawn from Horn (1989, p. 229); (5d-e) are drawn from Horn (1989, p. 499))<sup>1</sup>:

- (4) a. Everyone hasn't arrived yet. ( $\forall > > \neg$ ;  $\forall < < \neg$ )  
 b. All of them didn't come.  
 c. Both of them didn't come.  
 d. (Both) Lee and Kim didn't come.
- (5) a. Many of them haven't arrived yet. ( $\exists > > \neg$ ;  $*\exists < < \neg$ )  
 b. One of them didn't come.  
 c. (Either) Lee or Kim didn't come.  
 d. Many students didn't take classes after 4 P.M.  
 e. A lot of wine wasn't consumed.

In (4a-d) the universal subject QP takes inverse scope below negation. This reading can be accounted for by saying that the universal subject QP undergoes QL to the lower position than negation. If May's assumption that QL may apply freely to any type of QPs were correct, then the existential subject QP in (5a-e) would also be expected to take scope below negation. But this is not the case. This means that contrary to May's assumption, QL is affected by the type of QPs.

On the other hand, if we examine the two types of QPs in object position, the scope pattern noted in (4) and (5) is reversed, as in (6) and (7) (All the examples in (6) and (7) are drawn from Sohn (1995, p. 166);

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1) Sohn (1995, p. 165) also discussed the following example (i), which is similar to (5e). He observed that the existential subject QP before a verb must take wide scope above negation, while the former after a verb can have either wide or narrow scope with respect to the latter:

i) Many people didn't attend the meeting.

also see Hornstein (1995, p. 171)).<sup>2)</sup>

- (6) a. John didn't like every student. ( $\neg \gg \forall$  ;  $*\neg \ll \forall$ )  
 b. John didn't like all the students.  
 c. John didn't like both students.
- (7) a. John didn't like many students. ( $\neg \gg \text{many}$  ;  $\neg \ll \text{many}$ )  
 b. John didn't like five students.  
 c. John didn't like a few students.

In (6) the universal object QP cannot have wide scope over negation. In (7), on the other hand, the QP modified by the existential quantifier *many* can have inverse scope over negation. The contrast in (6) and (7) suggests that QR is affected by the type of QPs, contrary to May's uniform analysis of them.

Second, another instance of asymmetry between the universal and the existential QPs bears on their scopal interaction with an intensional predicate. Let us consider the following examples.

- (8) a. Everyone seems to be absent from class. ( $\forall \gg \text{seem}$  ;  $*\forall \ll \text{seem}$ )  
 b. Someone seems to be absent from class. ( $\exists \gg \text{seem}$  ;  $\exists \ll \text{seem}$ )

Recall that according to May (1977, 1985), QL may apply to any type of QPs. It is then predicted that the subject QP can take inverse scope below the intensional verb *seem* in both (8a) and (8b). The fact is, however, that only existential QPs can have inverse scope below intensional verbs. In the case of universal QPs, on the other hand, only the surface scope is realized. This is again taken to suggest that QL is sensitive to the type of QPs.

Noting that May's uniform approach is not effective in accounting for quantifier scope in general, we will explore plausible answers to the following questions:

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2) Lasnik (1972) also already noted that the existential object QP can take either wide or narrow scope with respect to negation, discussing the following example:

i) I couldn't solve many of the problems.

- (9) a. Why can universal QPs in subject position take inverse scope below negation but not below an intensional predicate?  
b. Why can existential QPs in subject position take narrow scope below an intensional predicate, but not below negation?
- (10) a. Why can universal QPs in object position not take inverse scope over negation?  
b. Why can existential QPs in object position take wide scope over negation?

In the course of exploring these answers, we will define properties of the two types of quantifiers: i.e., universal and existential QPs. Furthermore, we will show how the syntactic principles of economy step in to yield or block quantificational interpretations. In particular, adopting economy principles such as Fox's (2000) *Shortest Move* (SM) and Rizzi's (1990) *Relativized Minimality* (RM), we will argue that universal QPs are SM-governed (i.e., undergo covert scope-taking movement to an immediate node with propositional meaning (a *phase*, originally developed in Chomsky (2000, 2001a, b)), whereas existential QPs are not, and that only the movement of the latter is subject to another economy principle of *Relativised Minimality* (RM).

This paper is organized as follows. In section 2, core assumptions are delineated which we will employ to account for the questions raised above. Section 3 will show that problematic aspects of Neg-QP interaction follow from both the syntactic principles of economy and the distinct properties that the two types of QPs have. Section 4 will investigate into the consequences that the present analysis brings up. Finally, section 5 will wind up with a brief summary and conclusion.

## 2. Setting the Stage

### 2.1. Quantifier Scope and Economy

Following Fox (2000), Sauerland (2000) and Bruening (2001), we first assume that quantifier movement (i.e., both QR and QL) obeys the syntactic principle of economy. More specifically, we suggest that when a QP undergoes scope-taking movement, it targets the *closest* proposition-

denoting maximal projections such as  $\nu P$  and TP. Let us formulate this generalization as follows.<sup>3)</sup>

(11) *Shortest Move* (SM)

Each step of scope-taking movement of  $\alpha$  targets the *closest* phase  $\beta$ , where  $\alpha$  belongs to the class of universal quantifiers and  $\beta$  corresponds to  $\nu P$  or TP.

The principle of *SM* dictates covert movement of the two QPs in (12a) as illustrated in (12b) and (12c), yielding wide scope of *everyone* over *someone* as well as of *someone* over *everyone*.

- (12) a. Someone loves everyone. ( $\exists >> \forall$ ;  $\exists << \forall$ )  
 b. [TP Someone [ $\nu P$  everyone [ $\nu P$   $t_{\text{someone}}$   $\nu$ -loves [ $\nu P$   $t_V$   $t_{\text{everyone}}$ ]]]].  
↑  
via QR  
 c. [TP  $t_{\text{someone}}$  [ $\nu P$  everyone [ $\nu P$  someone  $\nu$ -loves [ $\nu P$   $t_V$   $t_{\text{everyone}}$ ]]]].  
↑  
via QL

In (12b) *everyone* in the object position undergoes QR and adjoins to the *closest* phase  $\nu P$ . According to Fox (2000) and Sauerland (2000), this type of quantifier movement is obligatory since a QP takes scope at the *closest* proposition-denoting phase and hence is not sensitive to the semantic (or interface) condition.<sup>4)</sup> In this structural context, when *someone* in the subject position is adjoined to and takes scope at TP, it accounts for the fact that *someone* takes scope over *everyone*.

In addition, *someone* in the subject position, which has been raised overtly to the Spec-TP position for the EPP reason, undergoes QL and is

3) Fox (2000) originally defines a clause-denoting maximal projection, not *phase*, as a target to which quantifier moves. However, we suggest that the same kind of maximal projections correspond to units with propositional meaning. In this sense, we adopt Chomsky's (2000, 2001a, b) notion of *phases* rather than clause-denoting maximal projections, modifying Fox's *Shortest Move*. Note, however, that we depart from Chomsky (2000, 2001a, b), in that we take TP, not CP, and  $\nu P$  to be a *phase* constituting a target for scope-taking quantifier movement. For the convincing argument that TP may play a role as a *phase*, see Johnson (2001).

4) The condition of semantic (or interface) economy that Fox (2000) proposes is defined as follows:

i) Scope-shifting operations (SSOs) cannot be semantically vacuous.

re-placed to the base-generated position inside the *closest* phase  $\nu P$ , as shown in (12c).<sup>5</sup> In this way, inverse scope of *someone* below *everyone* is accounted for.

However, differing from the previous analyses (i.e., Fox, Sauerland and Bruening) which argue that *SM* is a necessary condition for quantifier movement to be legitimate, we suggest that a notable distinction between universal and existential QPs exists. That is, unlike the former that move only to the *closest* phase, the latter undergo unbounded scope-taking movement. The following two sets of examples make this point:

- (13) a. Someone promised to attend every class. ( $\exists \gg \forall$ ; \* $\exists \ll \forall$ )  
 b. Someone expected that everyone was spying for the Dean.  
 ( $\exists \gg \forall$ ; \* $\exists \ll \forall$ )  
 c. Someone believes that the teacher beat every student.  
 ( $\exists \gg \forall$ ; \* $\exists \ll \forall$ )
- (14) a. Everyone promised to meet some students. ( $\forall \gg \exists$ ;  $\forall \ll \exists$ )  
 b. Everyone expected that someone was spying for the Dean.  
 ( $\forall \gg \exists$ ;  $\forall \ll \exists$ )  
 c. Everyone believes that the teacher beat some students.  
 ( $\forall \gg \exists$ ;  $\forall \ll \exists$ )

In (13a-c), universal QPs occurs either in the object position of the control complement clause or in the subject or object position of the finite clause. It is noteworthy that each of these QPs cannot take wide scope over the existential QP in the matrix subject position. This fact is an expected one, given that universal QPs can take only one step phase-bounded movement in the case of QR. That is, since the universal QP in (13a-c) can raise only to the *closest* phase, its covert movement is limited to the embedded clause. On the other hand, since QL is restricted to the base-generated position of a moved element, the existential QP in the matrix subject position can lower only to the matrix [Spec,  $\nu P$ ] position. In this structural environment, the existential QP only takes scope over the

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5) For this reason we adopt the copy theory of movement as well as quantifier lowering. However, departing from the standard version of the former in Chomsky (1993, 1995) (and his subsequent work), this paper assumes that the copy trace left by overt movement plays an important role in marking a lower bound to which a certain QP undergoes QL. See also Park and Park (2002, p. 258) for the relevant discussion.





the former involve extraction out of an island context. In specific, (15) violates the *Wh-Island constraint* and (16), the *Neg-Island constraint*. Both of these constraints together with the *Factive Island constraint* have recently been unified into the *Weak Island constraint*.

To account for the contrast in scope interpretation between (15a)/(16a) and (15b)/(16b), Longobardi (ibid.) argues that scope reconstruction can take place only along links of antecedent government. In (15a) and (16a), the fronted *wh*-phrase can be moved back to the position where it takes scope, say, to the embedded [Spec,  $\nu$ P] position. This accounts for its narrow scope interpretation it has in relation to the embedded universal subject QP. In (15b) and (16b), however, because of the intervening A'-specifier in the embedded [Spec, CP] position or the intervening negative marker, the existential *wh*-phrase cannot be moved back to the embedded [Spec,  $\nu$ P] position. In more concrete ways, we assume following Cinque (1990) that a modified version of Rizzi's (1990) *Relativized Minimality* as in (17) is responsible for the inability of a *wh*-phrase to reconstruct across the intervening *wh*-phrase or negation element:

(17) *Relativized Minimality* (RM)

Two positions  $\alpha$  and  $\beta$  can relate to one another if one c-commands the other and there is no position  $\nu$  of the same type as ( $\alpha$ ,  $\beta$ ), and  $\nu$  also c-commands  $\beta$ .

To sum up, we have shown that a preposed existential *wh*-phrase shows *WI* effects when its reconstruction involves lowering across an intervening *wh*-phrase or negation element. In particular, we have ascribed the *WI* effects to a violation of the principle of *RM*. In 3.1.2, we will extend this analysis of the *WI*-related reconstruction asymmetry to other cases where the existential subject QPs cannot take narrow scope across negation in A-movement.

### 3. Toward an Analysis

In this section, we will offer full-fledged solutions to the questions brought up in the section 1 which are concerned with the asymmetry between universal and existential QPs in their inverse scope relations. Given the two types of universal and existential QPs, we will show that

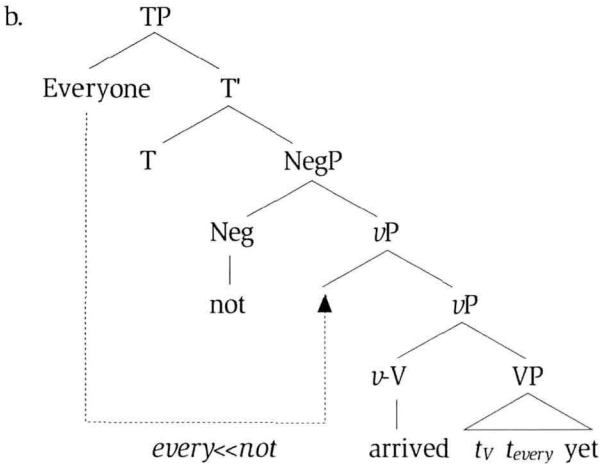
scope possibilities of QPs in relation to negation or intensional predicate follow from the principles of syntactic economy such as *Shortest Move* (SM) and *Relativized Minimality* (RM).

### 3.1. A-movement and Reconstruction of Quantifiers

#### 3.1.1. Universal QPs in the Subject Position and Scope

To begin with, let us examine the scope interaction of subject QPs with negation or an intensional predicate. As noted above, universal QPs in subject position can get lower scope below negation as in (4a), repeated below as (18a).

(18) a. Everyone hasn't arrived yet. ( $\forall > \neg$ ;  $\forall < \neg$ )



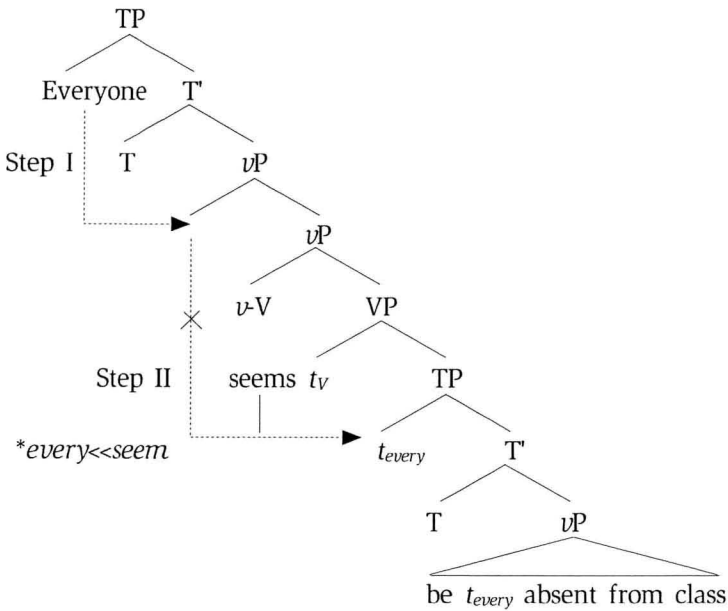
In accordance with the principle of *SM*, the universal QP in the subject position undergoes QL only to the *first* closest phase as represented in (18b), whereby *everyone* takes inverse scope below the negation. Note that when the universal QP undergoes covert quantifier movement, it is not sensitive to the presence of the negation, which constitutes a (in this case, downward) *Weak Island* for QL of existential QPs. In other words, the latter does not induce any *RM* effects on QL of the former.

Universal QPs in subject position, however, cannot have a lower reading below an intensional predicate like *seem* as noted in (8a), repeated below as (19a):

(19) a. Everyone seems to be absent from class. ( $\forall >> seem$ ;  $*\forall << seem$ )

That is, the subject QP *everyone* in (19a) can take only surface scope with respect to the intensional verb. This is because QL of the universal QP is limited only to the *first closest* phase and further lowering into the next *closest* phase embedded TP is prevented by the principle of *SM*. In other words, the principle allows lowering at Step I, but not further lowering at Step II, as shown in (19b).

(19) b.



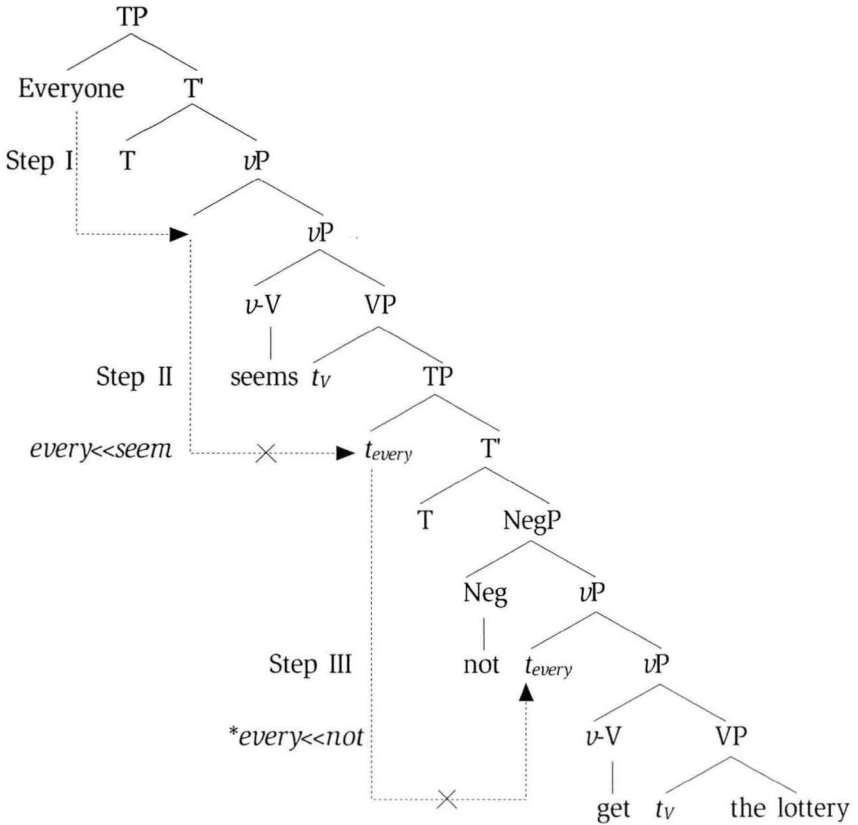
Incidentally, if our approach to the scope relation of universal subject QPs with negation or intensional predicate is on the right track, we can correctly predict more complicated scope relations as in (20a).

(20) a. Everyone seems not to get the lottery.  
 ( $\forall >> seem >> \neg$ ;  $*seem >> \forall >> \neg$ ;  $*seem >> \neg >> \forall$ )

The sentence in (20a) contains both the intensional predicate and the negation. According to the present analysis, the subject universal QP of this example is predicted to undergo local QL to the *first* phase (that is,

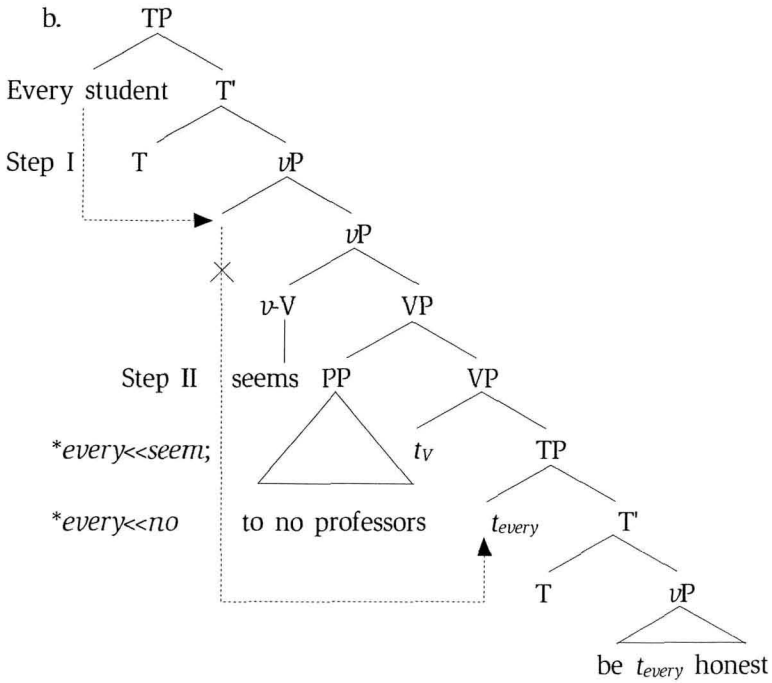
the matrix  $\nu$ P). Accordingly, only the surface scope *every*>>*seem*>>*not* is predicted to obtain. This prediction is achieved, as schematized in (20b) below.

(20) b.



Likewise, the *closest phase*-bounded local movement of universal QPs can also account for the rigid scope that universal subject QPs take with respect to either *seems* or the experiencer *no professor* in (21a). As the principle of *SM* mandates that *every student* in (21a) undergo local QL only to the *first* closest phase  $\nu$ P, but not any further down, the universal QP cannot be reconstructed to the position lower than either the verb nor the experiencer, as represented in (21b).

(21) a. Every student seems to no professors to be honest.  
 (∀ >> seem >> no one only)



Accordingly, the universal subject QP only takes the widest scope with respect both to the intensional predicate and the experiencer NP.

In summary, our hypothesis that QL of universal QPs is bounded to the *closest* lower phase accounts for sundry scope possibilities they create.

### 3.1.2. Existential QPs in Subject Position and Scope

Let us now move onto the scope relations concerning existential QPs in subject position with respect either to an intensional predicate or negation. Note, first of all, that unlike universal QPs, existential QPs in subject position can take narrow scope below intensional predicate. Consider the sentence in (8b), repeated below as (22a).

(22) a. Someone seems to be absent from class.  
 (∃ >> seem ; ∃ << seem)

The scope relation that the existential subject QP in (22a) has tells us at

least two things. First, as pointed out above, the two types of QPs show a different behavior *vis-a-vis* covert quantifier movement. That is, while universal QPs target the *first closest* phase, existential QPs undergo unbounded quantifier movement.<sup>6)</sup> Second, notice that though the intensional verb *seem* belongs to the class of scope-sensitive elements, it does not constitute an intervener for quantifier movement. We take this to imply that intensional verbs do not carry any syntactically activated features which bring about WI effects.<sup>7)</sup>

Given the properties of existential QPs and intensional predicates, we can say that *someone* in the subject position of (22a) can undergo QL to the embedded Spec-TP position and eventually, to its base position, as illustrated in (22b).

6) As suggested in Park and Park (2002), scope-taking covert movement (either QR or QL) of universal QPs, which is limited to the closest phase, seems to be parallel to A-movement in general (cf. Hornstein, 1995, 1999). On the other hand, existential QPs undergo unbounded covert movement, which seems to mimic A'-movement in general.

7) As for the previous approaches to *Weak Island* effects with resort to syntactic features, it is worthwhile to note Starke (2001). Starke (2001) provides an algorithmic system of extraction out of *Weak Island* and *Weak Island* effects. He argues that it is possible to account for the two related phenomena in terms of both the anti-identity constraint, which is a revised version of Rizzi's (1990) *Relativized Minimality*, and the independently motivated syntactic feature tree, which are defined as in (i) and (ii), respectively (Starke, 2001, p. 11).

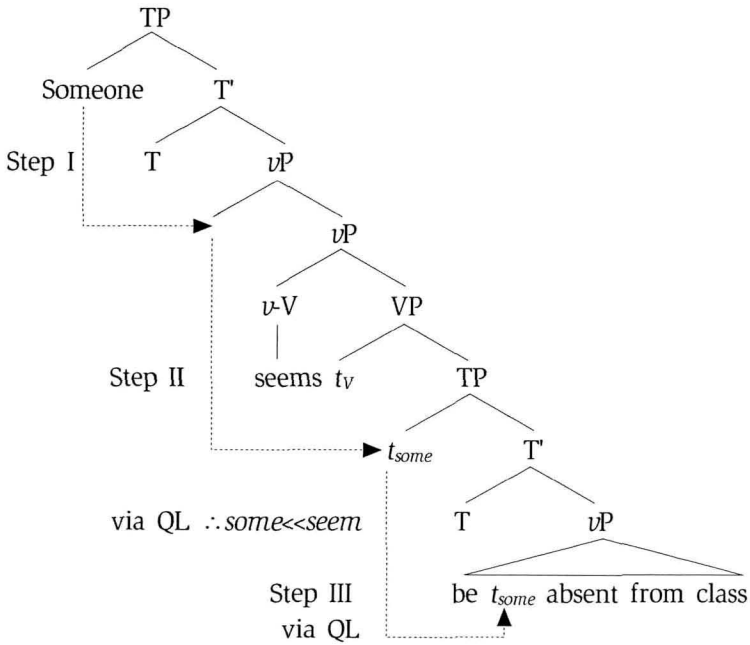
i) X-relating two occurrences of  $a$  is legal only if  $a \in X$  and there is no  $v, v \in X$  and  $v$  intervenes between the two occurrences  $a$ .

ii)

/		\
Quantifier	$\theta$	A
SpecificQ	$i\theta$	

The first class of feature Quantifier (Q-feature) and its subclass SpecificQ (SQ-feature) in (ii) bear on *Weak Island* effects, which materialize when the anti-identity constraint in (i) is violated. Extraction out of *Weak Island* is, on the other hand, permitted if a certain element with a Q-feature undergoes subclass movement (i.e., SQ movement), thus being allowed to move across an intervening element with a Q-feature without invoking a violation of the anti-identity constraint.

(22) b.

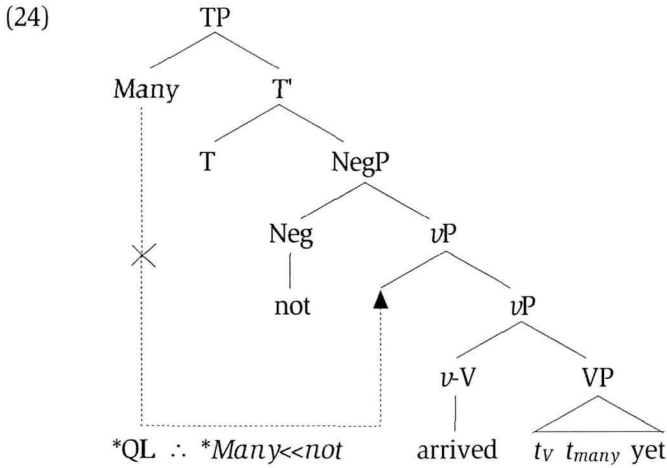


This unbounded QL of the existential subject QP accounts for the inverse scope that it takes below the intensional predicate in (22a).

On the other hand, unlike universal ones, existential QPs in subject position cannot take inverse scope below negation, as in (5a), repeated below as (23).

(23) Many of them haven't arrived yet.  $(\exists >> \neg; * \exists << \neg)$

Recall that negation functions as a selective blocker constituting a weak island for existential QPs. Therefore, QL of the existential QP across the negation results in a violation of the principle of RM.

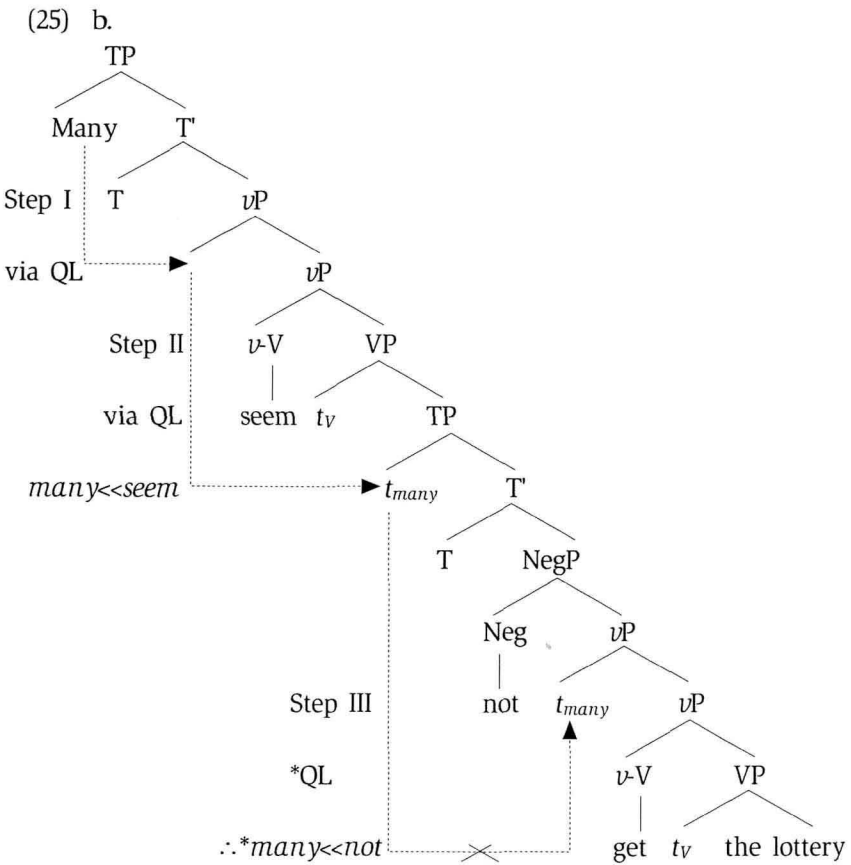


On the other hand, if we embed the negative clause below the intensional predicate as in (25a) below, the existential subject QP can take intermediate scope below *seem*, but above the negation. That is, the scope relation available is  $seem \gg \exists \gg \neg$ :

- (25) a. Many of them seem not to get the lottery.  
 ( $\exists \gg seem \gg \neg$ ;  $seem \gg \exists \gg \neg$ ;  $*seem \gg \neg \gg \exists$ )

The existential QP *many of them* in (25) undergoes QL to the embedded [Spec, TP] position successive-cyclically. Note, however, that it cannot lower further to a position below the negation. If it did, the principle of *RM* would be violated owing to the presence of the intervening negation, as represented in (25b). This confirms us that the present analysis is on the right track.





Consider one more case involving existential QPs in subject position. Just like the ones raised to [Spec, TP] for an EPP reason in raising or unaccusative constructions, existential subject QPs in simple transitive verb constructions cannot take inverse scope below negation, as shown in (26a) and (26b) (Beghelli and Stowell, 1997, p. 82).

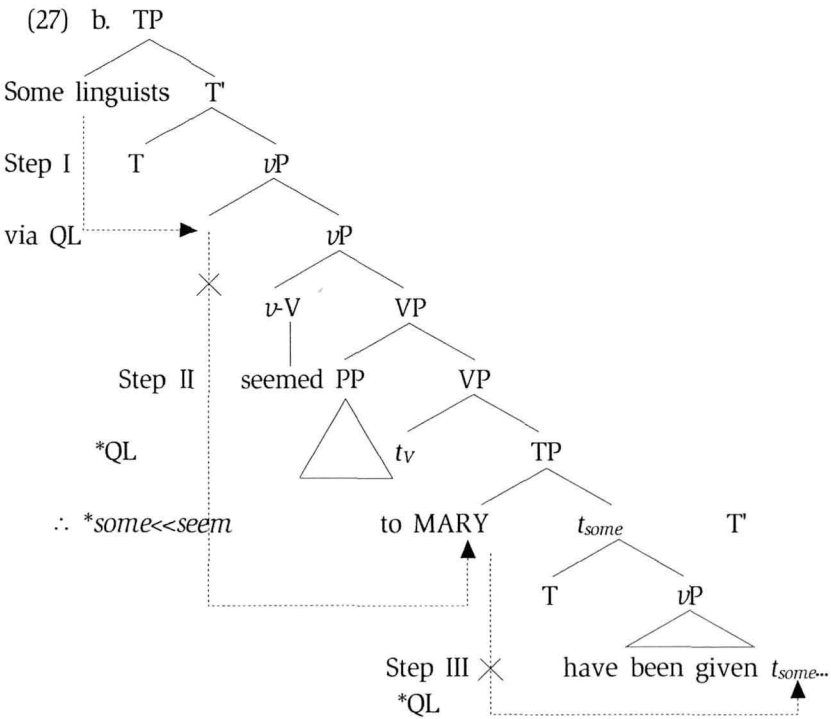
- (26) a. Two/some students didn't read this book.  
(two/some >> ¬; \*two/some << ¬)
- b. Two/some students read no books.  
(two/some >> ¬; \*two/some << ¬)

Furthermore, rigid scope of *some linguists* in (27a) below is attributed to the fact that the focused experiencer *Mary* constitutes a *Weak Island*

and thereby blocks the existential QP from lowering across it.<sup>8)</sup>

- (27) a. Some linguists seemed to MARY to have been given good job offers. (∃ >> *seem* ; \*∃ << *seem*)

In other words, QL of the existential QP across the focused QP results in a violation of the principle of RM, as its QL across negation does. That is why the narrow scope reading of the former QP below the latter focused element is not available, as represented in (27b).



In summary, our proposal that QL of existential QPs are unbounded but sensitive to the presence of *WI*-inducing elements accounts for a varied paradigm of scope relations they create.

8) The fact that a focused element may constitute a weak island has been already noted in the literature (cf. Rooth (1992) and Merchant (2000), among others).

### 3.2. Inverse Scope of In-situ Quantifiers and Quantifier Raising

This section is concerned with the questions raised in (10a) and (10b): (i) Why can universal QPs in object position not take inverse scope over negation? (ii) Why can existential QPs in object position take wide scope over negation? We will also account for the scope interaction between the QPs in object position and other scope sensitive elements.

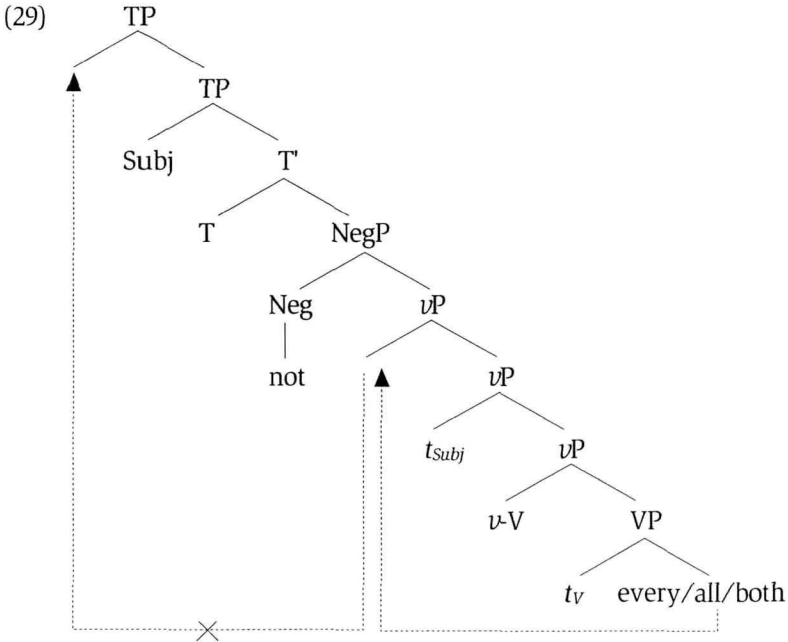
As we pointed out above, when they undergo QL, universal QPs in subject position always employ scope-taking movement to the *first* immediate phase. Existential ones in the same position, in contrast, may take unbounded QL, but they are sensitive to the presence of negation. It will be shown in this section that these two generalizations also play instrumental roles in accounting for the scope interpretations of both universal and existential QPs in the object position of transitive constructions. To the extent that the account makes correct predictions, it will in turn render additional support to our approach to the two types of QPs.

#### 3.2.1. Universal QPs in Object Position and Scope

First of all, let us consider the following sentences, where universal QPs are positioned in object position. As noted above, these sentences are interpreted unambiguously, with the universal QP only taking narrow scope below the negation:

- |   |   |
|---|---|
| (28) a. John didn't like every student. | $(\neg \rightarrow \forall; * \neg \leftarrow \forall)$             |
| b. John didn't like all the students.   | $(\neg \rightarrow \forall; * \neg \leftarrow \forall)$             |
| c. John didn't like both students.      | $(\neg \rightarrow \textit{both}; * \neg \leftarrow \textit{both})$ |
| d. I couldn't solve every problem.      | $(\neg \rightarrow \forall; * \neg \leftarrow \forall)$             |

As in our above analysis of universal QPs in subject position that undergo quantifier-lowering, let us suppose that universal QPs undergo QR only to the *first closest* phase. Then, all the universal QPs in the object position of (28a-d) are covertly raised only to the *first closest* phase  $\nu P$ , but not any further above it, taking scope below the negation. In other words, the *phase*-bounded nature of universal QPs accounts for the inability of the object universal QPs to take wide scope over negation, as represented in (29) below.



To sum up, universal QPs in object position behaves in exactly parallel fashion to those in subject position, in that their scope-taking movement is restricted to the *first* closest phase.

3.2.2. Existential QPs in Object Position and Scope

Unlike universal QPs in object position, however, existential ones in the same position can take either narrow or wide scope over negation, as shown in (30):

- (30) a. John didn't like many students. (→>>many; ¬<<many)
- b. John didn't like five students. (→>>five; ¬<<five)
- c. John didn't like a few students. (→>>a few; ¬<<a few)

We take this to reflect on the fact that, as argued above, existential QPs in contrast to universal ones take scope somewhat freely. In other words, they either take *phase*-bounded scope movement or take unbounded scope movement.

In more specific, each of the existential object QPs in (30) can undergo QR to an outer [Spec, vP] position. In this position, it takes narrow scope

below the negation.

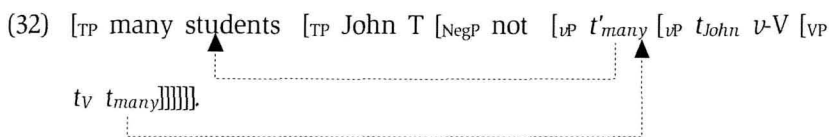
Alternatively, it also has an option of undergoing unbounded QR to adjoin to TP. The question that arises, however, is why this QR does not result in a violation of the principle of *RM*. Recall that existential QPs in subject position cannot take scope below negation. We argued that this is because QL of an existential QP across negation always results in inviting a violation of the principle of *RM*. How can we distinguish QR of an existential QP across negation from its QL across negation? It is noteworthy that one important distinction between them lies in the interpretation that results from scope-taking QR or QL. Provided that it undergoes QR across negation, an existential quantifier always receives specific interpretation. By contrast, provided that it undergoes QL below negation, an existential QP always receives non-specific interpretation. Since the latter is not allowed, the generalization emerging is that only a specific existential QP can move across negation without inviting a violation of the principle of *RM*.

The generalization is what we need anyway, independently of QR. The following case in (16b), which is repeated as (31), makes this point:

- (31) How many patients<sub>i</sub> don't you think that every one of the doctors can visit  $t_i$  in one hour? (*how many* »  $\forall$  only)

In (31), overt *wh*-movement occurs across negation without violating the principle of *RM*. Recall that the fronted existential *wh*-phrase in (31) only takes wide scope over the negation, thereby being interpreted as specific. Put in another way, we can say that only a specific *wh*-phrase can undergo *RM*-circumventing movement across negation.

It is reasonable to suppose that each of the existential QPs in (30) takes this option of exploiting *RM*-circumventing unbounded QR to adjoin to TP, as in (32):



The existential QP in the TP-adjoined position of (32) receives specific interpretation.

Before leaving this section, let us have one word about *RM* effects. We noted that the existential QPs which undergo *RM*-circumventing movement across negation have to be interpreted as specific. This means that *RM* effects obtain when non-specific existential QPs move across negation. If so, QL of existential QPs across negation leads to a violation of the principle of *RM* because they are non-specific; obviously, QL would make them take narrow scope below negation and receive non-specific interpretation.

#### 4. Consequences

In this section, we briefly review the recent approaches to quantifier scope, advanced by Hornstein (1995) and Beghelli and Stowell (1995), and show that their approaches do not fare better than our proposals. First, Hornstein (1995, p. 170) claims that scope interpretations follow from the property of A-chain. For instance, the reason that the sentence in (33a) is interpreted as (33c) but not as (33b) is because the object QP undergoes A-movement to the [Spec, AgroP] position, but not above it; therefore, it takes narrow scope below the negation.

- (33) a. John didn't eat everything.  $(\neg \gg \forall; * \neg \ll \forall)$   
 b. Everything is such that John didn't eat it.  $(\neg \ll \forall)$   
 c. It is not the case that John ate everything.  $(\neg \gg \forall)$

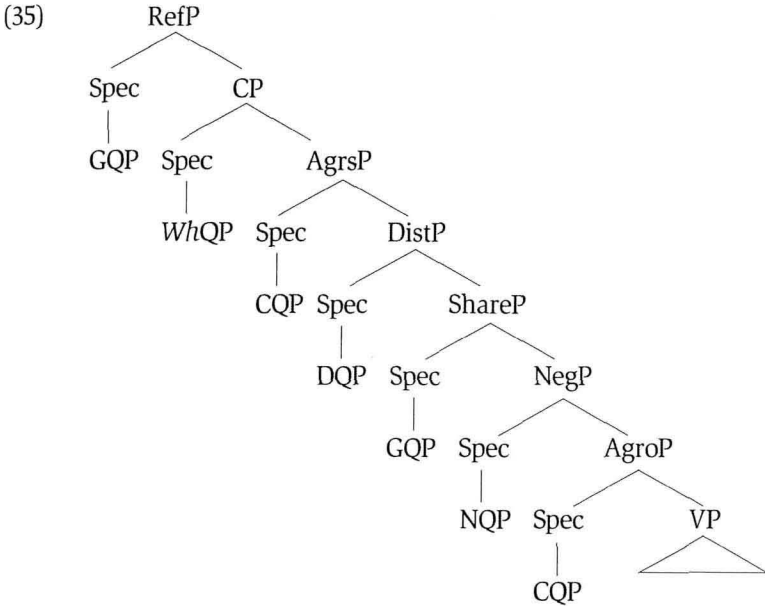
Though Hornstein's analysis makes a correct prediction regarding the scope interaction of object universal QPs in relation to negation, but as you can point out, it fails to accounts for the inability of subject universal QPs to take narrow scope below intensional raising predicates, as noted in (19a).

Meanwhile, Beghelli and Stowell (1997, pp. 95-6) take a different approach by claiming that Distributive-Universal QPs (DQPs) in the object position of (34) cannot have inverse scope over negation.

- (34) a. John didn't read every book.  $(\neg \gg \forall; * \neg \ll \forall)$   
 b. One boy didn't read every book.  $(one \gg \neg; * \neg \ll \forall)$

According to Beghelli and Stowell, to get a (non-collective) distributive

reading, DQPs such as *every* (and *each*) have to move to the specifier position of DistP and check their [+Dist] features under agreement with a distributive operator  $\forall$  in Dist<sup>0</sup>. Furthermore, for the element in the [Spec, DistP] position to receive proper interpretation it is required that either an overt indefinite Group-denoting QP (GQPs) or a covert event QP should move covertly to the Spec-ShareP and plays a role as a distributed share. The clause structure that Beghelli and Stowell (1997, p. 76) conceive is as follows.



In this analysis, the failure of the object DQP to get inverse scope over negation as in (34a-b) is not due to the lack of the distributed share, but to the characteristic property of *every*. Beghelli and Stowell (1997, p. 103) argue that unlike a true universal distributive quantifier *each*, the DQP headed by *every* in the object position within the scope of negation introduces a set variable, which has to be bound by the closest potential binder, i.e., the negative operator. For this reason, *every book* cannot move any further (to the Spec-DistP) across NegP. This accounts for its lack of inverse scope over negation in (34a-b). In our analysis, however, its lack of inverse scope is attributed to the general characteristic of universal QPs, whose scope-taking movement is restricted only to the *first*

closest phase. To the extent that our analysis is successful, we do without recourse to Beghelli and Stowell's assumption of prolific functional categories.

## 5. Conclusion

We have shown that unlike May's (1977, 1985) uniform quantifier movement hypothesis, the two distinct types of QPs undergo different types of quantifier movement. In addition, we have proposed that quantifier movement obeys such syntactic principles of economy as *Shortest Move* and *Relativized Minimality*, just as pure syntactic movement does. Given these assumptions, we have accounted for the somewhat puzzling questions raised in (9) and (10).

In particular, the scope asymmetry between the universal and the existential QPs in the subject position with respect to negation is due to (downward) *Weak Island* effects. The former can undergo only *first phase*-bounded local movement, without inducing *Weak Island* effects. The latter cannot take QL across negation, owing to *Relativized Minimality*. Meanwhile, another type of asymmetry concerning scope interaction in relation to intentional predicates follows from the difference in boundedness between the two types of QPs. That is, QL of universal QPs are bounded only to the *first closest* phase, whereas existential QPs can undergo unbounded downward movement across intentional predicates into their base position.

Furthermore, it has been shown that the scope asymmetry between the two types of QPs in object position with respect to negation receives the same analysis as we have offered for the QPs in subject position. Object universal QP can undergo *first phase*-bounded scope-taking movement, predicting that they always take narrow scope below negation. On the other hand, object existential QPs undergo covert QR to a [Spec, *vP*] position, thereby taking scope below negation. Alternatively, they can take an option of exploiting *RM*-circumventing unbounded scope movement across negation and are interpreted as specific.



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Received: Mar. 4, 2003

Revised version accepted: Aug. 2, 2003

Accepted: Aug. 14, 2003