A Reduced Approach of QR to a Discourse-oriented Movement

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1. Introduction

A main topic in this paper is on the nature of the Quantifier Raising (QR) in English. Traditionally, QR is assumed to be a cover movement and adjoined to TP. To the best of my knowledge, the study of QR departs from the seminal pieces of work presented by Chomsky (1977) and May (1977) and the current most representative analysis could be Fox (1995, 2000). In this paper, however, we will explore the possibility of landing on the fine-grained CP domain which is opposed to the conventional analysis of adjunction to TP.

It is well-known that the scope of quantifiers is basically clause-bounded. As represented by Chomsky (1977) and May (1977), quite a few linguists make an assertion of this. This argument is motivated by the observation in (1).

(1)  
a. A reviewer thinks every play will fail this season.  
\[
\text{a > every, \hspace{1cm} *every > a}
\]

b. A reviewer attended every play this season.  
\[
\text{a > every, \hspace{1cm} every > a}
\]  
(Potsdam 2013: 674)

c. Someone expected every Republican would win.  
\[
\text{some > every, \hspace{1cm} *every > some}
\]  
(Hornstein 1995: 156)

d. A different student said that I had read every book.  
\[
\text{a > every, \hspace{1cm} *every > a}
\]  
(Johnson 2000: 198)
(1a) indicates there is no scope ambiguity of the universal quantifier phrase *every play* with the indefinite subject *a reviewer*. The same fact holds in (1c) and (1d), too. On the other hand, (1b) shows that there are actually two readings. One of those readings is such a case that the indefinite subject *a reviewer* takes wide scope over the universal quantifier phrase *every play*. The other case is that the universal quantifier phrase *every play* is construed over the indefinite subject *a reviewer*. In the case that the universal quantifier takes wide scope over the indefinite subject, the operation of Quantifier Raising is supposed to apply to the quantifiers. The relevant LF structures are represented in (2).

(2)  
\[
\begin{align*}
\text{(a) } & \quad \text{*[TP every play}_{i} \ [TP a \text{ reviewer thinks TP } t_{i} \text{ will fail this } \text{season }] ]} \\
\text{(b) } & \quad [TP \text{ every play}_{i} \ [TP a \text{ reviewer attended } t_{i} \text{ this season }] ]
\end{align*}
\]

(Potsdam 2013: 674)

According to the traditional analyses presented by May (1997), Fox (2000) and Potsdam (2013), (2a) demonstrates the case of (1a), where the QR applies to the Universal Quantifier, but this operation failed. As for the case of (2b), the QR applies to the universal quantifier in the same way and the quantifier succeeds in moving from its base position to the TP adjunction site. Based on the observation in (2), the possibility of QR depends on whether the related two NPs are clause-mate or not.

However, Kennedy (1997) and Fox (2000) give some counterexamples. Take a look at (3).

(3)  
\[
\begin{align*}
\text{(a) } & \quad \text{A reviewer knows when every play will fail.} \\
\text{a > every, every > a} \\
\text{(Fox 2000: 64)}
\end{align*}
\]

\[
\begin{align*}
\text{(b) } & \quad \text{At least two American groups expect to visit every European country this year.} \\
\text{at least two > every, every > at least two} \\
\text{(Kennedy 1997: 674)}
\end{align*}
\]
Each example in (3) reveals that applying QR operation to embedded QPs and adjoining them to TP in their main clauses are acceptable. As a result, the inverse scope reading across the clause-boundary is borne out in each sentence of (3). Fox (2000) proposes two significant conditions; that is, Scope Economy and Shortest Move. According to his statement, all the sentences in (3) satisfy both conditions. I will give his detailed account of it later. This is why the QR operation to embedded quantifiers and their cross-clausal movements are justified.

Yet, Potsdam (2013) is skeptical of Fox’s assertion and brings up some conflicted data to the instances in (3). The relevant data is shown in (4).

(4)  
(a) Don’t more than four people go on vacation!  
(b) It shouldn’t be the case that more than four people go on vacation.  
\[ \text{NEG} \succ \text{more than 4} \]
(i.e., Fewer than four people go on vacation!)

(c) *There should be more than four people who don’t go on vacation.  
\[ \text{*more than 4} \succ \text{NEG} \]
(i.e., *More than four people don’t go on vacation!)

(Potsdam 2013: 679)

(4a) is a sentence of the negative inverted imperative which contains a QP. The negative head seems to be located in the C-head in (4a). Potsdam calls such a case “CP-Negation”. Note that there is no ambiguity regardless of the position of the QP as for the interpretation of this configuration. This is problematic and misleading if we follow Fox’s account since we predict that the inverse scope reading with regard to QP is possible.

In this article, I attempt to give a principled account which resolves the paradox in (3) and (4). To be more specific, I bring in the cartographic approach and suggest that the relevant negative elements and quantifiers should be displaced on the appropriate landing sites in the fine-grained CP domain.
2. Overview of Previous Work

2.1. Fox (2000)

As we have briefly observed in the introduction, in order to capture the contrast between (1) and (3), Fox (2000) advocates two important notions which I present below in (5).

(5)  
   a. *Scope Economy*  
       QR must have a semantic effect.  
   b. *Shortest Move*  
       QR moves a QP to the closest position in which it is interpretable.

(Fox 2000: 23)

Scope Economy in (5a) is a condition that the application of QR is permitted only if the operation contributes to Semantics. To give a more concrete example, QR is licensed given the condition that a quantifier phrase must produce an inverse reading after the operation of QR. Moreover, on the assumption that QR is an instance of A-bar movement, Shortest Move in (5b) forces quantifier phrases is subjected to locality constraints on movement. Following (5a) and (5b), all quantifier phrases must meet (5a) and (5b) if their application of QR is conducted and if they are adjoined to some non-argument XP. Fox expect that cross-clausal QR is impossible as a result of the interaction between Scope Economy and Shortest Move. Let us check how he explains the clause-boundness in (1) under his analysis. (6b) and (6c) demonstrate that the LF structures of (1a), which QR applies in two ways.

(6)  
   a. A reviewer thinks every play will fail this season. (= (1a))  
   b. *[TP every playi [TP a reviewer thinks [CP [TP ti will fail this season]]]]  
   c. *[TP every playi [TP a reviewer thinks [CP ti [CP [TP ti will fail this season]]]]]

In (6b), the quantifier phrase *every play* directly moves to the matrix clause and the quantifier is adjoined to the matrix TP. However, this operation violates Shortest Move in (5b) because the first potential site for the quantifier to land on is the embedded CP-adjunction site. On the other hand, in (6c), the application of QR to
the quantifier phrase every play obeys Shortest Move, but landing on the embedded CP-adjunction site does not create any semantic consequence. This violates Scope Economy in (5a).

In brief, if QR does not obey Shortest Move, it fails because of the general economical constraint on movement. If QR heads for a clausal node, obeying Shortest Move, it is also illicit. This is because such an operation does not usually yield a new semantic effect, so it violates Scope Economy.

Quite interestingly, Fox (2000) suggests that a cross-clausal QR is even possible if it satisfies Scope Economy and Shortest Move. Look at his example in (3a), which I repeat here in (7a).

(7) a. A reviewer knows when every play will fail. (= (3a))
   a > every, every > a

   b. [TP every playi [TP a reviewer knows [CP ti [CP whenj [TP ti will fail tj]]]])]

   (Fox 2000: 64)

(7a) is ambiguous and has two readings. I will explain how the lower Universal Quantifier can take wide scope over the upper quantifier. In the LF structure in (7b), the quantifier’s first adjoining position is the embedded CP. Lading on this position meets the both conditions: Scope Economy and Shortest Move. Since the wh-phrase when in the embedded Spec-CP can be regarded as a scopal element, it interacts with the quantifier and makes the quantifier every play to take wide scope. Then, the quantifier every play adjoins to the matrix TP and takes scope over the subject a reviewer. This is how the cross-clausal QR achieves, obeying Scope Economy and Shortest Move.

However, Potsdam (2013) is doubtful of the interaction between quantifiers and scopal elements in the embedded CP. In the next section, I will introduce Potsdam’s description and generalization with regard to CP-negation.

2.2. Potsdam (2013)

Potsdam (2013) tests Fox’s proposition which embedded quantifiers can take
scope over the upper scopally related elements if they interact with scopal elements in the embedded CP domain obeying Scope Economy and Shortest Move. Potsdam offers the case of negation where C-head hosts a negative item. He calls such a case CP-negation. It is widely known that negation introduces scope ambiguities. The related example is given in (8).

(8) a. She didn’t answer at least two questions.
   b. It is not the case that she answered at least two questions.
      \( \text{NEG} > \text{at least 2} \)
   c. There are at least two questions that she didn’t answer.
      \( \text{at least 2} > \text{NEG} \)

(Potsdam 2013: 678)

Thus, he considers it should be a prime candidate for licensing an application of QR adjunction to CP under Fox’s analysis. To conclude, his data come to reveal that quantifier phrases cannot take scope over CP-negation. Let us investigate his data from (9) to (12).

(9) a. Don’t more than four people go on vacation!
   b. It shouldn’t be the case that more than four people go on vacation.
      \( \text{NEG} > \text{more than 4} \)
   c. * There should be more than four people who don’t go on vacation.
      \( \text{*more than 4} > \text{NEG} \)

(10) a. # Don’t anybody skip at least three questions!
   b. # It mustn’t be the case that anybody skips at least three questions.
      \( \text{NEG} > \text{at least 3} \)
   c. * It must be that there are at least three questions that nobody skips.
      \( \text{*at least 3} > \text{NEG} \)

(11) a. Only this semester didn’t John fail at least one student.
   b. It’s not the case that John failed at least one student.
      \( \text{NEG} > \text{at least 1} \)
   c. * There is at least one student that John didn’t fail.
      \( \text{*at least 1} > \text{NEG} \)
(12) a. Don’t at least two women candidates realize they are being used to split the vote?
   
   b. Is it not the case that at least two women candidates realize that they are being used to split the vote?
   
   \[ \text{NEG} > \text{at least 2} \]
   
   c. * Are there at least two women candidates who don’t realize that they are being used to split the vote?
   
   \[ *\text{at least 2} > \text{NEG} \]

(Potsdam 2013: 679-680)

These data bring out that the inverse readings of the relevant quantifier phrases are not possible in these constructions. To be more exact, negation always takes wide scope over quantifier phrases in the configuration of CP-negation. Grounded on these examples, Potsdam (2013) makes a descriptive generalization in (13).

(13) **The CP-Negation Scope Generalization**

CP-negation takes wide scope with respect to QPs in its clause.

(Potsdam 2013: 681)

If we follow Scope Economy and Shortest Move suggested by Fox (2000), we mistakenly predict a list of data from (9) to (12) to have a wide scope reading of the lower QPs, yielding the incorrect LF structure in (14b).

(14) a. Don’t more than four people go on vacation!
   
   b. \[ [\text{CP} \ more \ than \ four \ people_i \ [\text{CP} \ [\text{C} \ don’t \ i \ [\text{IP} \ t_j t_i \ [\text{VP} \ go \ on \ vacation] \ ]]]] \]

(Potsdam 2013: 680)

(14b) indicates that the quantifier phrase’s landing site on the edge of CP is justified because there is a scopal interaction between the quantifier and negation. As a result, Fox’s Scope Economy-based approach inappropriately predicts there occurs an inverse scope reading. This is problematic for Fox’s analysis and the paradox between clause-boundedness and unboundedness of QR remains unclear. Although Potsdam provides counterexamples to Fox’s (2000) arguments and the generalization of CP-negation, he does not offer a specific alternative analysis. Thus,
I will work on this issue in the next section.

3. Proposals

Modifying the spec-head analyses to quantifiers argued by Beghelli and Stowell (1997) and Szabolcsi (1997), I propose a cartographic approach advocated by Rizzi (1997) to handle both contradicting data.

3.1. Various Functional Projections for QPs


(15) a. Interrogative QPs (WhQPs): what, which man, etc.
    b. Negative QPs (NQPs): nobody, no man, etc.
    c. Distributive-Universal QPs (DQPs): each every
    d. Counting QPs (CQPs): few, fewer than x, at most x, more than x, etc.
    e. Group-Denoting QPs (GQPs): indefinite QPs (a, some, several, one student, etc.), definite QPs (the students, etc.)

(Beghelli and Stowell 1997: 73)

These quantifier phrases are supposed to land on spec positions of the relevant functional projections as shown in (16).
Coming along with the argument by Beghelli and Stowell, Szabolcsi (1997) also assumes there are functional projections for the related QPs to sit on and they serve to explain the QR clause-boundedness and unboundedness. Her diagram is presented in (17).

As Szabolcsi admits in her article, her analysis is parallel to Beghelli and Stowell (1997). This is shown in (18).

I agree with their notion that QR should be reduced to one of the general
movements to fulfill the relevant feature checking. However, there are some issues in their work. First of all, from the perspective of acquisition, it is questionable to assume such a number of functional projections for quantifier phrases (see Bruening 2001). This seems ad hoc. Secondly, their analyses come to be unviable when it comes to the cases where an inverse scope reading with regard to lower quantifiers is possible. The concrete data are (4), which I repeat here in (19).

(19)  a. A reviewer knows when every play will fail. (= (4a))

         a > every, every > a

         (Fox 2000: 64)

   b. At least two American groups expect to visit every European country this year. (= (4b))

         at least two > every, every > at least two

         (Kennedy 1997: 674)

For the reason that they assume their series of functional projections in every clause, it is impossible for the lower quantifier phrases to cross over the embedded clause. To be more technical, the relevant functional projection should freeze the movement of QP. Bearing these issues in mind, I will show an alternative approach in the next subsections.

3.2. Cartographic Approach

Following the basic notion suggested by Beghelli and Stowell (1997) and Szabolcsi (1997), I also insist that QR should be reduced to the general movement. I suggest that a quantifier phrase turns into focus in a sentence if QR applies to it and the inverse scope reading is generated. To sum up, QR is replaced with Focus Movement. I investigate whether focus interpretation is produced when the inverse scope reading is licensed and not licensed.

A capital letter means Focus. The hash mark (#) means the information structure is odd and the intended focus interpretation does not occur in such a case.
(20) a. A reviewer thinks every play will fail this season. (= (1a))
   * every > a reviewer
b. #It is EVERY PLAY that a reviewer thinks will fail this season.
c. A reviewer attended every play this season. (= (1b))
   every > a reviewer
d. It is EVERY PLAY that a reviewer attended this season.
e. Someone expected every Republican would win. (= (1c))
   * every > someone
f. #It is EVERY REPUBLICAN that someone expected would win.
g. A different student said that I had read every book. (= (1d))
   * every > a
h. #It is EVERY BOOK that a different student said that I had read.

(20a), (20e), and (20g) make it clear that the intended focus interpretation is not usually borne out if the inverse scope reading with respect to the lower quantifier phrases is not available. On the other hand, (20c) tells that focus interpretation is created if the inverse scope is available. The same goes for the examples in (3), which I duplicate in (21).

(21) a. A reviewer knows when every play will fail. (= (3a))
   every > a
b. It is EVERY PLAY that a reviewer knows when it fails.
c. At least two American groups expect to visit every European country this year. (= (3b))
   every > at least two
d. It is EVERY EUROPEAN COUNTRY that at least two American groups expect to visit.

In (21a) and (21c), the lower quantifier phrases are taken as focal items when they are moved out of their embedded clauses. The same thing holds in the case of CP-negation. The related data from (9) to (12) are repeated in (22).
(22) a. Don’t more than four people go on vacation! (= (9a))
   
   \[ \text{NEG} > \text{more than 4} \]

   b. FEWER THAN FOUR PEOPLE can go on vacation!
   
   c. #Don’t anybody skip at least three questions! (= (10a))
   
   \[ \text{NEG} > \text{at least 3} \]

   d. # Nobody can skip AT LEAST THREE QUESTIONS!
   
   e. Only this semester didn’t John fail at least one student. (= (11a))
   
   \[ \text{NEG} > \text{at least 1} \]

   f. He failed NO STUDENT.
   
   g. Don’t at least two women candidates realize they are being used to split the vote? (= (12a))
   
   \[ \text{NEG} > \text{at least 2} \]

   h. NO ONE realizes they are being used to split the vote.

All the instances in (22) demonstrate that the relevant quantifier phrases are counted as focal elements when it comes to CP-negation. This fact is compatible with the Focus Condition on QPs proposed by Nishioka (2004).

(23) **Focus Condition on QPs**

   QPs to be interpreted as the focus of partial negation must be in the immediate c-command domain of Pol with \ [+\text{NEG}] .

   (Nishioka 2004: 330)

   Taking these facts into consideration, I suggest that the lower QPs are displaced to the spec, FocP in a root clause to be interpreted as focus in the case of the inverse scope reading with respect to a lower quantifier phrase and CP-negation.

   Thus, I depict the structure in (24). As for negation, I employ Nishioka’s (2004) approach and assume PolP in the CP domain.

(24) a. Don’t more than four people go on vacation! (= (9a))

\[
\begin{array}{cccccccc}
\text{[ForceP} & \text{Force} & \text{[PolP} & \text{Don’t} & \text{[FocP} & \text{more than four people} & \text{Foc} & \text{[FinP} & \text{Fin} \\
\text{[TP} & \text{t} & \text{T} & \ldots & \text{][][][]} & \end{array}
\]
b. Only this semester didn’t John fail at least one student. (= (11a))

\[
\begin{align*}
&\text{ForceP} \quad \text{Force} \quad (\text{Contrastive]} \quad \text{TopP} \quad \text{Only this semester} \quad \text{PolP} \quad \text{didn’t} \\
&\hspace{1cm} \text{FocP} \quad \text{at least one student} \quad \text{Foc} \quad \text{FinP} \quad \text{Fin} \quad \text{TP} \quad \text{John} \quad \text{T} \quad \text{vP} \quad \text{fail} \quad \text{t_i} \\
\end{align*}
\]

One might point out that my system cannot capture the fact in (3) correctly because there should be a rich CP structure even in a subordinate clause. This means a lower QP is freezed within an embedded clause and it cannot move up to a root clause. In short, my approach might suffer from the same issue as Beghelli and Stowell (1997) and Szabolcsi (1997). I argue in the next section that this would not happen in my analysis.

### 3.3. Defective CP structure

Haegeman (2006, 2012) classifies two types of adverbial clauses. One is the central and the other is the peripheral. Central adverbial clauses have a modifying function to the events represented in main clauses. They do not have an independent ForceP, TopP, and FocP so that they depend on their root clauses. On the other hand, peripheral adverbial clauses provide listeners with background information or evidence. Therefore, they have an independent ForceP, TopP, and FocP.\(^1\)

(25) a. Central Adverbial Clause : Sub Mod* Fin TP

b. Peripheral Adverbial Clause : Sub Force Top* Focus Mod* Fin


The contrast is attested in (26) and her theory is supported by (27) in which topicalization cannot occur in central adverbial clauses.

(26) a. ??* If frankly he’s unable to cope, we’ll have to replace him

b. [A referendum on a united Ireland ]…will be a “good thing”, because frankly they need to be taken down a peg and come down to earth and be a little bit more sober in their approach to things.

(Haegeman 2012: 174)

The *if*-clause in (26a) is classified into the central adverbial clause and this sentence shows that a higher adverb *frankly* which is strongly related to ForceP cannot appear...
in the central case. On the other hand, the peripheral case in (26b), it is allowed.

(27) *If these exams you don’t pass next week you won’t get the degree.

(Haegeman 2012: 187)

Bearing this in mind, let us examine the sentences in question.

(28) a. A reviewer knows when every play will fail. (= (3a))

b. [ForceP Force[FOCP every playi FocFinP Fin[TP A reviewer T [vP knows ]]]]

[SubP when t_i will fail]

c. At least two American groups expect to visit every European country this year. (= (3b))

d. [ForceP Force [FOCP every European countryi Foc [FinP Fin[TP At least two American groups [vP expect [TP to visit t_i this year ]]]]]]

The temporal when-clause in (28a) is regarded as the central one. Therefore, its CP structure is defective and it does not have FocP to host the relevant universal quantifier every play. This leads the universal quantifier to target at the FocP in the main clause. The structure is shown in (28b). As for the case in (28c), it is the ECM construction. It means the compliment clause should be TP. This is supported by conjunction tests in (29) and (30).

(29) a. We didn't intend [XP you to get hurt].

b.* We didn't intend [XP you to get hurt] or [CP for him to hurt you].

(Radford 2004: 108)

(30) a. What I'll try and arrange is [CP for you to see a specialist].

b.* What we hadn’t intended was [TP you to get hurt].

(Radford 2004: 107)

(28c) does not have CP, so there is no place to hold the relevant QP. Therefore, it is possible to move it up to the main clause.
Finally, as for pronunciation, I follow the current copy theory and assume there is a copy of the relevant quantifier phrase. When it comes to the inverse reading, the lower quantifier phrase is located in the spec, FocP, but the upper one is not supposed to be pronounced via PF-deletion. Instead, the lower one is pronounced in PF side.

5. Conclusion

Throughout this paper, we have seen the flaw in Fox’s approach: Scope Economy and Shortest Move. Sentences of the negative inverted imperative which contains a QP and the negative head is located in the C-head (CP-negation) are introduced as the counterexamples by Potsdam (2013). Despite the fact that Potsdam (2013) seems to be successful in generalizing the scope interpretation with respect to CP-negation in (13), which I display again in (31), he does not offer a specific analysis to ensure both cases where inverse scope readings of lower QPs are borne out and negative elements located in C-head always take wider scope over lower QPs.

(31) The CP-Negation Scope Generalization (= (13))

CP-negation takes wide scope with respect to QPs in its clause.

(Potsdam 2013: 681)

Grounded on Potsdam’s data, I offer an alternative approach employing the defective cartography advocated by Hageman (2006, 2012). The main point is that the traditional QR can be reduced to Focus Movement considering the empirical data that reveal that lower QPs should be interpreted as foci in their sentences when they take scope over upper ones. This argument is also in conformity with the Focus Condition on QPs proposed by Nishioka (2004).

(32) Focus Condition on QPs (= (23))

QPs to be interpreted as the focus of partial negation must be in the immediate c-command domain of Pol with [+NEG].

(Nishioka 2004: 330)
Since my analysis is still shallow and immature, it goes without saying that I need further investigation including cross-linguistic perspectives to fully demonstrate that the operation of QR is reducible to Focus Movement. It is my hope that the nature of QR is unraveled and the motivation of the operation is proved via more general linguistic theories in addition to sufficient empirical cross-linguistic data.

**Notes**

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1. Haegeman (2006, 2012) investigates English and Hebrew argument fronting in addition to Romance Clitic Left Dislocation (CLLD) which particularly focuses on Southern Italia dialect data and assumes that there are a variety of functional projections in the CP: SubordinateP (=SubP), ForceP, TopicP* (=TopP*), FocusP (=FocP), ModifierP* (=ModP*), and FiniteP (=FinP). The mark of asterisk ‘*’ indicates the relevant projections can be recursive. The notion behind distinction of SubP from ForceP is that the former hosts the subordinating conjunction while the latter encodes illocutionary Force. See Bhatt and Yoon (1992) in detail. ModP is assumed to accept initial adverbial adjuncts. Although the order of various functional projections in the CP domain proposed in Haegeman (2012) is slightly different from the one in Haegeman (2006), I adopt her work in 2012 in this paper.
References


