

Rightward Movement and Output Economy*

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1. Introduction

This paper investigates some consequences of Fox's (2000) Output Economy (1)-(3) for the syntax-semantics of rightward movement in verb-final languages. Some verb-final languages including Korean, Japanese, Hindi, and Turkish allow existence of arguments at post-verbal position, as exemplified in (4) with Korean.

- (1) *Output Economy* (Fox 2000)
Optional operations can apply only if they have an effect on outcome
- (2) *Scope economy* (Fox 2000: 21)
OP [a set of operations] can apply only if it affects semantic interpretation (i.e. only if inverse scope and surface scope are semantically distinct).
- (3) *Word order economy* (Fox 2000: 75)
Overt optional operations cannot be string-vacuous (i.e. they must reverse the relative order of the two – perhaps phonologically overt – expressions)
- (4) Postverbal arguments in Korean (examples from Choi 1987:40)¹
 - a. Chelswu-ka mek-ess-ta *sakwa-lul*
 Chelswu-ka eat-Past-Dec apple-Acc
 ‘Chelswu ate an apple’

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¹ Throughout the paper, postverbal arguments are italicized and the object shifted leftward is marked with an underline, for the sake of visibility.

- b. Chelswu-ka sakwa-lul cwu-ess-ta Yenghi-eykey
 Chelswu-ka apple-Acc give-Past-Dec Yenghi-Dat
 ‘Chelswu gave an apple to Yenghi’
- c. Chelswu-ka cwu-ess-ta sakwa-lul Yenghi-eykey
 Chelswu-ka give-Past-Dec apple-Acc Yenghi-Dat
 ‘Chelswu gave an apple to Yenghi’

One recurrent question on this construction is how the postverbal arguments are generated in verb-final languages. One of the representative approaches argues that the post-verbal argument has undergone rightward movement [RM], as in (5)a (cf. Choe 1987, Kural 1997, Takano 2005). The other camp, however, argues that the post-verbal argument involves bi-clausal structure with ellipsis, as schematized in (5)b: the object undergoes leftward movement [LM] in the second clause, and the rest of the second clause is elided under identity (cf. Kuno 1978, Whitman 2000, Tanaka 2001, Abe 2004). In this paper, we provide experimental evidence from Korean for the RM analysis (5)a, and advance a new perspective to capture certain restrictions in RM. In particular, we propose that RM has special scope/binding properties, distinct from those of LM, due to the interactions of Word order Economy (3) and Shortest Move (cf. Richards 2001). We also discuss some consequences of our proposal for long distance RM and cross-linguistic convergence and divergence in RM.

(5) Previous analyses on postverbal arguments

a. [[Subj t_{obj} V] Obj]: Rightward Movement Analysis



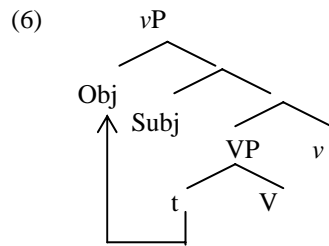
b. [_{CP} Subj *pro*₁ V] [_{CP} Obj₁ [~~Subj~~ t_{obj} ~~V~~]]: Bi-clausal Analysis

2. Proposal: RM into the inner-edge

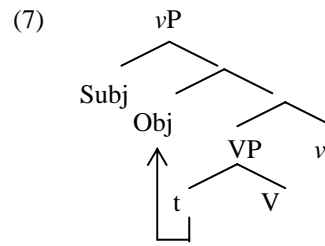
Recent work on leftward scrambling argues that object undergoes vP -internal scrambling to the outer vP -edge, instead of inner vP -edge, as in (6) (Miyagawa 2001, Kitahara 2002, Ko 2007, among others). We argue that (6) is expected under Output Economy (1)-(3) as well. If the object moves to the inner edge of vP , as in (7), the movement is both semantically and phonologically vacuous. The operation that shifts the object leftward neither changes the scope between the subject and the object at LF, nor it changes the word order within vP . Hence, movement of the object into the inner vP -

edge does not satisfy either (2) or (3). If economy is evaluated at each phase (vP and CP), (7) can be ruled out by (1).

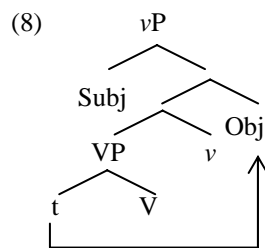
Unlike other previous proposals on (6) based on locality or cyclicity, however, Economy leads us to make a further prediction for RM. If we assume that SOV order is the base-order in verb-final languages, object movement to post-verbal position is *not* phonologically vacuous: as shown in (8), the object does move across the verb, and hence observes the Word Order Economy. Consequently, the object may in principle move to the inner (right) edge of vP without violating the Output Economy, in contrast to the case of LM. Moreover, if shorter step (8) is preferred over longer step (9) (cf. Richards's (2001) Shortest Move), we predict that the object must "tuck-in" below the subject, occupying the inner (right) vP-edge. In this paper, we argue that this is indeed the case. More generally, we propose that LM targets the outer-edge of the phase vP whereas RM targets the inner-edge of the phase vP.



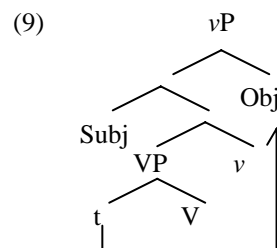
√LM to outer-edge



*LM to inner-edge



√RM to inner-edge



*RM to outer-edge

3. Scope

Under our proposal, we expect a systematic asymmetry and symmetry between RM and LM, depending on the length of movement. Consider first the short distance movement. We predict that the hierarchical properties of

RM will be distinct from those of LM in short distance movement. Since the object with RM does not c-command the subject or trace of the subject, we expect that the object in (8) would not scope over the subject, unlike the object with LM in (6).² In contrast, we expect that RM and LM would show the similar properties in long distance movement. The basic premise of our proposal is that postverbal object does undergo rightward *movement*. Given the claim that arguments undergoes reconstruction after long distance A'-movement (Mahajan 1990, Saito 1989, 1992, Sohn 1995, among others), we expect that the object with long distance movement, whether it is RM or LM, would be structurally lower than the matrix subject.

To test our prediction, we designed eight context sets compatible only with inverse scope, where the object scopes over the (matrix) subject, but not the other way around. Each context accompanies three types of sentences: canonical order, LM, and RM. Four of the 8 context sets tested the effects of short distance movement (e.g. (11)), and the other four context sets tested long distance movement (e.g. (13)). We asked twenty Korean native speakers to judge the relative acceptability (0-5 scores) of triplet sentences in each given context (cf. methods adapted from Bard, Robertson, and Sorace 1996). We first gave the subject a scenario in which the object must scope over the subject [e.g. (10), (12)], and then asked whether a sentence with canonical SOV order, RM order, and LM order would be acceptable under the given context [e.g. (11), (13)].

(10) *Scenario* (intended reading, 'all>>two', but not '*two>>all'):

At nine o'clock, they showed only Harry potter and Lord of the Rings in theater T at the same time. No more than four children came to watch, maybe because the weather was unpleasant. Toli and Swuni watched Harry Potter while Cheli and Mini watched the Lord of the Rings [all contexts were given in Korean in our experiment]

(11) Scope test under the scenario (10): short distance movement

- a. Twu elini-ka motun yenghwa-lul poko issesseyo [SVO]
Two child-Nom all movie-Acc watch was.prog
- b. Twu elini-ka poko issesseyo *motun yenghwa-lul* [SVO, RM]
Two child-Nom watch was.prog all movie-Acc
- c. Motun yenghwa-lul twu elini-ka poko issesseyo [OSV, LM]
All movie-Acc two child-Nom watch was.prog
'Two children were watching every movie'

² This prediction holds only if the object stays within vP. If the object undergoes further RM in the higher domain, the object may be in a hierarchically higher position than the subject. See Ko (2009) for this possibility.

(12) *Scenario* (intended reading, ‘all>>two’, but not *‘two>>all’):

There are four male students in middle school A. They are Myengswu, Cinyeng, Chelswu, and Caykwun. This school runs school bus No.1 and school bus No.2. They say that one of the drivers was absent this morning, and so the school principal did the driving instead. Myeungswu and Cinyeng thought that the principal drove bus No.1 and the driver drove bus No. 2. On the other hand, Chelswu and Caykwun thought that the driver drove bus No.1 and the principal No. 2. [All contexts were given in Korean in our experiment.]

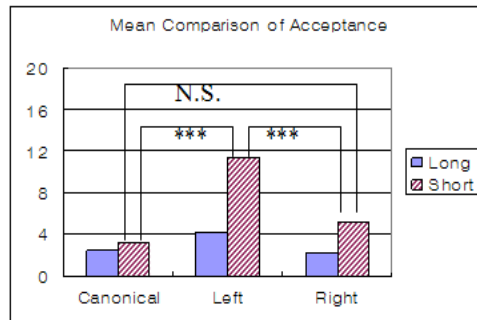
(13) *Scope test under the scenario (12)*

- a. *twu haksayng-i kyocangsensayngnim-i motun pesu-lul*
two student-Nom principal-Nom all bus-Acc
wuncenhaysstako sayngkakhaysseyo
drove thought
- b. *twu haksayng-i kyocangsensayngnim-i wuncenhaysstako*
two student-Nom principal-Nom drove
sayngkakhaysseyo motun pesu-lul
thought all bus-Acc [long RM]
- c. *motun pesu-lul* *twu haksayng-i kyocangsensayngnim-i*
all bus-Acc two student-Nom principal-Nom
wuncenhaysstako sayngkakhaysseyo
drove thought [long LM]
 ‘Two students thought the principal was driving all the buses’

If our proposal is on the right track, we predict that RM (11)b would be unacceptable with inverse scope, just like canonical SOV order in (11)a, whereas LM (11)c would be acceptable with inverse scope (cf. Hoji 1985, Suh 1990, Sohn 1995, i.a.). As for long distance movement, inverse scope would be unacceptable, either with leftward (13)c or rightward movement (13)b.

The experimental results confirm our prediction. As shown in (14), canonical order and short RM in (11) were judged unacceptable with inverse scope, in contrast to short LM. Moreover, as shown in (14), the sentences in (13) were judged all unacceptable under the inverse scope scenario (12). Paired sample t-tests show that the difference between canonical order and short RM, and the difference between short RM and short LM were statistically significant ($p < .0001$). No other pairs showed statistically significant differences, as expected.

(14) Mean Comparison of Acceptance



4. Binding

Our claim is further supported by binding tests. As shown in the variable binding test (15), the subject can bind the object with canonical SOV order and RM order. In contrast, the subject cannot bind the object with LM order (OSV).³ This again supports our proposal that the object with short RM is structurally lower than the subject, unlike the object with short LM. Conversely, the object with canonical SOV order and RM order cannot bind the subject, whereas the object with LM order can bind into the subject. This is exemplified in (16).

(15) Variable binding into the object

- a. Motun salam_{1-i} kuuy₁ emeni-lul kuliwehay [SOV]
all people-Nom his mother-Acc miss
- b. Motun salam_{1-i} kuliwehay kuuy₁ emeni-lul [SVO, RM]
all people-Nom miss his mother-Acc
- c. *kuuy₁ emeni-lul motun salam_{1-i} kuliwehay [OSV, LM]
His mother-Acc all people-Nom miss
'Every person₁ misses his₁ mother'

(16) Variable binding into the subject

- a. *kuuy₁ emeni-ka motun salam_{1-ul} kuliwehay [SOV]
his mother-Nom all people-Acc miss
- b. *kuuy₁ emeni-ka kuliwehay motun salam_{1-ul} [SVO, RM]
his mother-Nom miss all people-Acc

³ (15)c is expected under the assumption that A-scrambling does not reconstruct (see Mahajan 1990 for further discussion).

- c. motun salam₁-ul kuuy₁ emeni-ka kuliwehay [OSV, LM]
 all people-Acc his mother-Nom miss
 ‘His₁ mother misses every person₁’

Our conclusion is further supported by binding tests in long distance contexts as well. If our claim that the object with long distance movement must undergo reconstruction, we expect that long distance RM or LM of the object would not feed new binding relationship to the matrix subject (cf. Saito 1992). This is indeed the case, as shown in (17) (cf. (16))⁴

(17) Variable Binding

- a. *kuuy₁ emeni-ka [Chelswu-ka motwu salam-ul₁
 his mother-Nom Chelswu-Nom all person-Acc
 kuliwehanta-ko] malhaysse
 miss-C said
- b. *kuuy₁ emeni-ka [Chelswu-ka kuliwehanta-ko] malhaysse
 his mother-Nom Chelswu-Nom miss-C said
 motwu salam-ul₁
 all person-Acc
- b. *motwu salam-ul₁ kuuy₁ emeni-ka [Chelswu-ka
 all person-Acc his mother-Nom Chelswu-Nom
 kuliwehanta-ko] malhaysse
 miss-C said
 ‘His₁ mother said that Chelswu misses every person₁’

5. Implications and Remaining Issues

Note that the bi-clausal analysis (5)b cannot explain why RM shows different scope property from LM in short movement, but not in long distance cases. Since all postverbal arguments are assumed to undergo LM under this approach, we expect that there would be no difference between LM and RM. Thus, the contrast observed in scope and binding paradigms are not expected under this approach. At best, we may consider a possibility that the subject and *pro* bear a binding and scope relationship, but if *pro* can be scrambled to a higher position than the subject, as an overt pronoun in Japanese normally can, it is not obvious whether the subject c-commands *pro* at the first place (cf. Takahashi 2008)

It would be instructive to note here that postverbal arguments in verb-final languages are not unique to Korean. Japanese, Hindi, and Turkish are

⁴ The same pattern is observed with anaphor binding (see Ko 2009 for data and discussion).

known to allow such constructions. To solidify the current proposal, it would be necessary to evaluate our economy-based approach against other proposals and data from other languages. Mahajan (1997), in particular, reports that the scope and binding properties of postverbal arguments in Hindi are exact parallels of Korean data seen here. Interesting enough, however, Mahajan followed the exact opposite road from ours. Mahajan argues that there is no rightward movement in the grammar (*a la* Kayne 1994), and proposes that postverbal objects are *stranded* rather than moved to postverbal position (but see Bhatt and Dayal 2007 for criticism on this approach). It would be important to systematically compare the Korean and Hindi data, with corresponding theoretical discussions (Ko 2009 for some preliminary results). The data presented here, however, suggest that the remnant movement approach is not viable in some respects. If RM involved LM of the object and subsequent LM of the remnant clause, we would expect that the subject cannot bind the object in short RM, contrary to facts in (15). Our data also poses some challenges to the claim that RM targets [Spec,CP] (Kural 1997, based on Turkish data). Our data, in fact, suggest that the object with RM stays in inner ν P-edge below the subject. This, however, directs us to a new research agenda about why Korean and Turkish should behave differently.

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