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The FNQ-constructions and Remaining Problems*

GWANGRAK SON

Department of English Language and Literature, Kyungpook National University; gson@knu.ac.kr

Abstract: In literature, there are mainly two rival approaches for the FNQ-constructions in Korean and Japanese, the 'Locality' and the 'Cyclic Linearization.' And the former approach again has two distinct versions, a traditional 'strong' view (Haig, 1980; Kuroda, 1980; Miyagawa, 1989, 2001; Saito, 1985, etc.) and a 'weaker' view proposed by Miyagawa and Arigawa (2007) and Miyagawa (2010), This paper examines all these approaches in a wide variety of scrambling contexts, and shows that the revised Locality (i.e., a weak Locality) is the best; it explains many recalcitrant examples that pose significant problems under the other approaches. In this paper, I maintain that the revised locality still has some shortcomings. Crucially, it is a stipulation; it does not give an account as to why the subject-object asymmetry occurs in the distribution patterns of FNQs and why only subjects, but not objects, leave a licensing trace optionally. This paper claims that the real heart of the investigation to this area of research is; how we could explain the bewildering variety of trace patterns in a simple and principled way.

Keywords: floating numeral quantifiers, cyclic linearization, trace visibility, subject-object asymmetry, a strong locality, a weak locality

Ⅰ. Introduction

Japanese and Korean display constructions in which phrasal movement raises a portion of an argument DP overtly, leaving the remainder Numeral Quantifier (NQ) behind in the clause. In literature, such a construction is referred to as Floating Numeral Quantifier (FNQ) constructions, a term largely due to Sportiche (1988).[1] As seen in (1) below in

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1. Sportiche's (1988) proposal for a theory of floating quantifiers relies on two independently motivated assumptions: (i) a quantifier and its associate NP are generated under a single constituent, and (ii) the NP moves up for

Japanese, however, not all FNQs are permissible in the split context; the subject FNQs can hardly be separated from their host DPs, unlike the object FNQs.

(1) Classical subject-object asymmetry of FNQs (Haig, 1980; Kuroda, 1980; Saito, 1985)
a. *Gakusei-ga sake-o san-nin nonda.
student-NOM sake-ACC 3-CL_{people} drank
'Three students drank sake.'
b. Sake-o gakusei-ga san-bon nonda.
sake-ACC student-NOM 3-CL_{bottle} drank
'Students drank three bottles of sake.'

Until now, there have been mainly two rival approaches for this phenomenon, the 'Locality' and the 'Cyclic Linearization.' And the former approach again has two distinct versions, a traditional 'strong' view (Haig, 1980; Kuroda, 1980; Miyagawa, 1989, 2001; Saito, 1985, etc.) and a 'weaker' view proposed by Miyagawa and Arigawa (2007) and Miyagawa (2010), the aim of the later version being mainly to get around a number of vexing problems raised by Ko's (2007) 'Cyclic Linearization' approach. All these studies and their findings have significantly enlighten our understanding of the syntactic and semantic properties of scrambling phenomenon in the context of FNQ-licensing.

However, close scrutiny of full set of data reveals that many crucial questions are still unanswered. Despite a dramatic revision made in the later version of the Locality, problems still arise revolving around the original questions of how subject and object pattern differently in licensing FNQs, and how subject is even allowed to license its own NQs provided some special prosodic and discourse contexts (to be discussed in section 4). In this paper, I will show that at the heart of all these issues lies a matter of 'trace visibility,' that is, how we could account for the fact that a trace, left by DP-scrambling, is visible in some contexts but not in some other contexts. Since this single factor of 'trace visibility' plays a

some reasons while stranding the quantifier in its base-generated position. I take these assumptions holding throughout this paper.

determining role in resolving all the controversies raised thus far, the success of any future researches in this area of topics is contingent on how they could appropriately give a principled account for the emerging characteristics of 'trace visibility'.

Section 2 and section 3 examine the traditional Locality- and the Cyclic Linearization approach one after the other with some of the central problems embedded in them. Section 4 shows how all the recalcitrant problems, left unanswered under the previous two analyses, can be resolved by slightly modifying the traditional Locality. The revised locality approach, however, is fatally stipulative; it lacks a principled account for the statements it has to make in order to cover all the problems raised in literature. Section 5 summarizes the discussions and adds some directions for further studies in this area of research topics.

Ⅱ. The Strong Locality and Its Problems

The Locality approach has various versions (Haig, 1980; Kuroda, 1980; Miyagawa, 1989, 2001, 2010; Miyagawa & Arigawa, 2007; Saito, 1985), but they all share one common property that a quantifier and its associated DP observe 'strict locality,' defined in terms of 'mutual c-command'.[2] The original proposal of the Locality, advanced by Saito(1985) and discussed at length by Miyagawa (1989, 2001), crucially relies on a "Ban on Subject Scrambling", and in the era of GB it was assumed that the subject, unable to scramble, is merged directly in its surface position. Since the subject does not involve movement, it has no trace, which results in the stranded NQ with no licensing host. On the other hand, the object is assumed to scramble freely, leaving a trace that licenses its NQ. So, on this view, a key assumption to the subject-object asymmetry is the dichotomy of traces; the subject is prevented from scrambling and has no licensing trace behind, unlike the object which leaves a trace after scrambling. The contrast is schematized in (2).

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2. Locality requirement:
   a. The NQ and its associated NP observe strict locality (Saito, 1985).
   b. The NQ or its trace and the NP or its trace must mutually c-command each other (Miyagawa, 1989).

(2) a. *Gakusei-ga sake-o [san-nin] nonda.
b. Sake-o gakusei-ga [*t* san-bon] nonda.

As a reader might already have noticed, this account of the asymmetry can hardly maintain in its original form in the minimalist program, one major finding of which is that the subject is derived from its vP-internal position (Kitagawa, 1986; Kuroda, 1988; Koopman & Sportiche, 1991; Sportiche, 1988, etc.). Under the vP-internal subject hypothesis, (2a) could have the following structure (3), in which the subject has scrambled over the preposed object from its lower base position (Bobalik, 2003, p. 115; see also Bošković, 2004). This 'double-scrambling' structure, once proven its validity, will significantly weaken the Locality approach since it obliterates the disparate patterns of the traces between the subject and the object.

(3) Gakusei-ga sake-o [vP tSubj san-nin [VP tObj nonda]]

However, Saito's (1985) 'ban on subject scrambling' has a motivation beyond this for excluding such a derivation as (3), which involves 'string vacuous' movement. As compared to (2a), the structure (3) contains more steps of movement to arrive at the same word order, and hence it is considered less preferable in terms of 'Economy' condition. So, from the economy perspective, the Locality account still holds that (2a) is an optimal structure and that there is no licensing trace for the stranded subject NQ. If we strictly follow this line of approach—let us call this approach the 'strong Locality'—, the prediction is clear: there should be no stranded quantifier associated with the subject. Unfortunately, however, this prediction turns out to be too strong since in literature we find a number of stranded NQs associated with the subject occurring precisely in this structural format.

A further complication arises with the Locality analysis. Miyagawa (2001, 2003, 2005) has argued that Japanese does have EPP effects and that such a scope contrast as below comes as a consequence of EPP-movement by either the subject or the object to a position higher than negation.

(4) a. Zen'in-ga sono tesuto-o uke-nakat-ta (uo/to omou).
all-Nom that test-Acc take-Neg-past (excl/comp think)

'All did not take that test.'
*not > all, all > not

b. Sono tesuto-o zen'in-ga *t* uke-nakat-ta (uo/to omou).[3]
that test-Acc all-Nom take-Neg-past
'That test, all did not take.'
not > all, (all > not)

On Miyagawa's account, T bears the strong EPP-feature in Japanese, and hence it requires movement of some DP to [Spec, TP] in overt syntax; in (4a), the Spec of TP is occupied by the subject, while in (4b) it may be occupied by either the subject or the scrambled object. Crucially, in (4b), the subject can stay in situ in the specifier position of vP, where it may be interpreted within the scope of negation. If the subject could be externally merged in [Spec,vP] as we see here, and if we imagine that the higher subject in (4a) is indeed the one derived from the lower vP-internal position by scrambling (as we will claim later), the double-scrambling structure of (3) cannot be simply banished by "economy" because the movement operation of the subject is a bona fide fact. This consideration, then, turns us back to the initial quest of the subject-object asymmetry in (1) since on this view both DPs are allowed to scramble to TP and leave traces alike.

Does this state of fact indicate that the Locality account is now obsolete? Or could it be that both the structures (2a) and (3) coexist in Japanese grammar, as Miyagawa and Arigawa (2007) argue (see also Miyagawa, 2010), so each may represent the standard- versus the nonstandard case of the FNQ-constructions? [We may call this view the 'weak Locality' in which the subject may undergo scrambling and leave a trace.] If Miyagawa and Arigawa (2007) are correct in this regard, what makes the subject leave or not leave a trace in the same structural environment, and why does the subject pattern disparately in this way, in contrast to the object that invariantly leaves a trace? These are all non-trivial questions and still remain unanswered.

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3. In (4b), a preferred reading is the negation-wide scope reading (i.e., not > all), explicable on the assumption that the subject 'all' takes a position in [Spec,vP]. According to Miyagawa, 2001), the other reading, that is, the inverse scope reading of 'all > not' is due to a collective meaning of 'all'.

Ⅲ. The Cyclic Linearization and Its Problems

Capitalizing on Korean examples like the following, Ko (2007) claims that subject scrambling is nothing abnormal in itself. As illustrated in (5), an embedded subject may scramble over a matrix subject (5a), and it may even be separated from its NQ by a sentential adverb (5b). [See Kurata, 1991; Lee, 1993; Soh, 1995 for more examples pointing to this fact.]

(5) a. John-i_i [$_{CP}$ na-nun [$_{CP}$ t_i Mary-lul mannassta-ko]
John-Nom I-Top Mary-Acc met-Comp
sayngkakhanta]]
think
'John , I think that t met Mary.' (Ko, 2007:4, adapted from Sohn, 1995)

b. Haksayng-tul-i_i pwunmyenghi t_i sey-myeng maykcwu-lul
student-pl-Nom evidently 3-CLpeople beer-Acc
masiessta
drank
'Evidently, three students drank beer.' (Ko, 2007, p. 5)

With this observation and also by assuming that the subject is initially merged in [Spec,vP], Ko claims that the unacceptability of such examples like (1a) is not due to the fact that the subject is prevented from scrambling, but to the fact that its derivation runs afoul of the 'Linear Preservation' proposed by Fox and Pesetsky (2003, p. 1), stated in (6).

(6) Linear Preservation
The linear ordering of syntactic units is affected by Merge and Move within a Spell-out Domain, but is fixed once and for all at the end of each Spell-out Domain.

The key asset of the Linear Preservation is that ordering statements established in each cycle cannot be erased at PF and should be kept constant throughout derivation. In case of the object scrambling in (1b), the object first scrambles to the outer edge of vP over the

subject,[4] and then moves further to TP, presumably for the reason of EPP (Miyagawa, 2001). In this derivation, the ordering statements established in the vP does not change in the higher Spell-out domain of the CP. Consequently, the sentence is judged to be grammatical.

(7) (=(1b))

a. Sake-o gakusei-ga san-bon nonda.
   [O1 S t1 NQO V]
b. [vP O1 S [VP t1 NQO ...]]
   Linearize vP: O<S<NQO
c. [CP [TP O1 [vP t1' S [VP t1 NQO...]]]]
   Linearize CP: O<S<NQO [ordering preservation]

By contrast, in the double scrambling case of (1a)—see (3) for the relevant structure—, 'inconsistency' arises in the course of Transfer to PF. That is, when vP is spelled out after the object scrambles to the edge of the vP, the ordering is established as O<S<NQs (see (8b)). This ordering cannot maintain in the next cycle of Transfer in the CP when the subject also undergoes scrambling and sits above the scrambled object (8c). An ordering contradiction takes place and thus the derivation crashes at PF.

(8) (=(1a))

a. *Gakusei-ga sake-o san-nin nonda.
   [S2 O1 t2 NQS t1 V]
b. [vP O1 S NQS [VP t1...]]
   Linearize vP: O<S<NQS.
c. [CP S2 O1 [vP t'1 t2 NQS [VP t1 NQO...]]]
   Linearize CP: S<O<NQS [ordering contradiction!]

4. For Ko, this movement of the object to the edge of the vP is imposed. in compliance with the Phase Impenetrability Condition (Chomsky, 2000, 2001, 2008) which demands a constituent to move only by phase-by-phase cyclic computation.

In this analysis of Ko (2007)—she specifically dubbed this application to the FNQs as 'Cyclic Linearlization'(CL)—, there is a crucial hypothesis; the movement of the subject from [Spec, vP] to the outer Spec of the vP is prohibited. Were this vP-internal scrambling allowed, as illustrated in (9), the ordering statements of vP would be preserved in the next higher Spell-Out domain. If so, we would lose the account of why (1a) is judged unacceptable.

(9) (=(1a))

a. *Gakusei-ga sake-o san-nin nonda.
   [S2 O1 t2 NQS t1 V]

b. [vP S2 O1 t2 NQS [VP t1...]]
   Linearize vP: S<O<NQS .

c. [CP S2 O1 [vP t'2 t'1 t2 NQS [VP t1 NQO...]]]
   Linearize CP: S<O<NQS [ordering preservation]

For Ko, in order for a probe to attract a goal, the goal must be in the search space, or c-command domain, of the probe(Chomsky, 2000, 2001).[5] Since the [Spec,vP] is outside the c-command domain of v^0, no movement is possible from the inner Spec to the outer Spec of v^0. For this reason, such a derivation as (9) is claimed unlikely to happen. The illegitimate subject raising is illustrated in (10) below.

(10) *[vP S [vP O [vP [tS NQS][VP ...tO....]]]]

Whereas the Cyclic Linearization has advantages over the Locality by eliminating the disparate patterns of the traces between the subject and the object and by reducing them under the single linearization calculus within the minimalist framework, its precise status in the grammar has been the subject of considerable debate. At the heart of the debate is the presence of vast numbers of apparent exceptions that simply do not follow the Linear Preservation Principle. For instance, in the following examples in Japanese, the subject and

5. Ko (2007, p. 12), following Miyagawa (2001), assumes that scrambling is a feature-driven movement and is triggered by an EPP-feature on the probe.

its NQ are separated by the object in the same way as the ungrammatical (1a), yet the sentences are fairly well acceptable(see Gunji & Hasida, 1998; Ishii, 1998; Kuno, 1973; Kuno & Takami, 2003; Miyagawa & Arikawa, 2007; Nishigauchi & Ishii, 2003; Takami, 1998 for more Japanese examples).

(11) a. Gakusei-ga watasi-no hon-o futa-ri-sika
student-Nom my-Gen book-Acc 2-CLs-only
kaw-ana-katta.
buy-Neg-Past
'Only two students brought my book.' (Takami, 1998, p. 92)
b. ?Gakusei-ga sake-o imanmadeni san-nin nonda.
student-Nom sake-Acc so far 3-CLs drank
'Three students drank sake so far.' (Gunji & Hasida, 1998, p. 57)

In the same vein, the following, rather acceptable Korean sentences in (12) are all predicted to be doomed according to the CL analysis (see Kim, 2008; Moon, 2007; Son, 2010, 2011 for more examples pointing to this fact in Korean).

(12) a. (?)Haksaengtul-i keo maekju-lul se-myong masyeosseo.
students that beer-Acc 3-CLpeople drank
'Three students drank that beer.'
b. Marathon jujadeul-i kyeolseungjeum-ul taseos-myeong
Marathon runners-Nom finishing line-Loc 5-CLpeople
thongkwahaessta.
pass-Pst
'Five marathon runners have passed the finishing line.'

For all these sentences, a PF crash would occur because the ordering statement established at the vP domain (by the object scrambling to the edge of the phase, vP) would be altered in the higher CP-phase where the subject crosses over the fronted object, as we have already seen in (8). Even more strikingly, Miyagawa and Arikawa (2007, p. 651) reports that the example (1a), judged unacceptable, improves noticeably provided with a prosodic

break before the stranded subject NQ. The same mitigation effect obtains in Korean, as well.

(13) a. Japanese
?Gakusei-ga sake-o [PAUSE] san-nin nonda.
students-Nom sake-Acc 3-CLpeople drank
'Three students drank beer.'
b. Korean
?Haksaengtul-i maekju-rul [PAUSE] se-myeong
students-Nom beer-Acc 3-CLpeople
masieossta.
drank
'Three students drank beer.'

These examples all pose a non-trivial problem to the CL. In fact, this is not a problem to the CL alone. They also challenge to the Locality approach, in particular, to the strict version of the Locality which maintains that the subject bears no licensing trace. On this version, the subject cannot be associated with the stranded NQ in whatsoever environments. If the Locality approach has any way to show that a subject trace is somehow present in all these recalcitrant examples, it would, of course, resolve the present problems. But this suggestion has a paradox in itself; how can a subject leave or not leave a trace in the precisely same structural contexts?

Ⅳ. The Revised Locality and Its Problems

Facing this conundrum raised by the Cyclic Linearization, Miyagawa and Arikawa (2007) (see also Miyagawa, 2010) adds some additional devices to the traditional Locality, slightly departing from its previous pure syntactic paths. At the heart of their observation is the realization that these troublesome cases, what they refer to as 'non-standard' examples, do not share the same prosodic pattern with the standard ones. In particular, the non-standard examples typically contain a prosodic break between the preposed object and the

subject FNQ, so that the two adjacent expressions may not interfere with each other in the process of phonological organization and semantic interpretation. Based on this observation, they argue that since the non-standard paradigm differs in prosody from the standard paradigms, the two may well be associated with structures distinct one from the other. That is, according to them, a double scrambling structure is now available for the non-standard paradigm since it brings about a prosodic change and thus it is no longer a string-vacuous operation. (14b) below represents the structure for the non-standard paradigm (Miyagawa & Arikawa, 2007, p. 653).

(14) Non-standard paradigm

a. ?Gakusei-ga sake-o [PAUSE] san-nin nonda.

b. Derivation:

[TP S [TP O [vP tO [vP [tS NQS][VP ...tO....]]]]]

In (14b), the object first scrambles to the outer spec of vP, and then moves further to [Spec,TP], being triggered by the EPP on T (A-movement). Subsequently, the subject moves to a position higher than the initial Spec,TP through A'-scrambling. Thanks to this derivation of multiple scrambling, the subject now leaves a trace that successfully fulfills the locality requirement with the stranded NQ_{subj}. In Miyagawa and Arikawa(2007), this derivation is ruled in not just by the presence of the licensing trace, but also by the ensuing phono-semantic effect. That is, in (14), the subject NQ and the scrambled object occupy the separate projections, one in vP and the other in TP. This configuration enables the subject NQ to be contained in a phonological domain separately from the preceding object, so that it could avoid being construed as part of the object phrase.

Though Miyagawa and Arikawa have not explicitly mentioned, it is easily conceivable of what structure they have in mind for the standard paradigm like (1a). They claim that unlike the non-standard case of (14), the subject NQ in the standard paradigm is produced in the same prosodic phrase as the scrambled object, leading to a semantic 'misparse' that would fuse the two unrelated items into a single constituent (p. 650). Since their analysis is clearly built on the architecture of 'prosodic phonology', believing that syntactic and prosodic structures are closely related(Cho, 1990; Selkirk, 1986 among many others), their

structure for the standard paradigm should be like (15b).

(15) Standard paradigm

a. *Gakusei-ga sake-o san-nin nonda.

b. Derivation:

[TP S [vP [O NQS] [VP tO V ...]]]

In the above, the object scrambles to the edge of the vP, and is frozen there, unlike (14).[6] The stranded subject NQ in the vP, then, is erroneously organized in the same prosodic phrase with the adjacent object, resulting in a crash at LF.

On this analysis, the object scrambling case of (1b), repeated below as (16 a), has the representation either in (16b i) or (16b ii) depending on where the subject is externally merged (abstracting away the intermediate traces of the object).

(16) a. Sake-o gakusei-ga san-bon nonda.
sake-ACC student-NOM 3-CLo drank
'Students drank three bottles of sake.'

b. (i) [TP O [vP S [VP [tO NQO]...]]]
(ii) [TP O [TP S [vP [VP [tO NQO]...]]]]

In both representations of (16b), the object NQ and the preceding subject do not reside within the same maximal projection; whereas the NQ is in the VP, the subject is either in the vP or the TP (see (14b) for the alternate subject positions). Consequently, they are uttered in two separate phonological domains, without invoking a semantic interference of the kind observed in the standard cases of subject scrambling.

Though Miyagawa and Arikawa's proposal presents an interesting way of handling

6. If the object scrambles further to the TP, so it creates a derivation like (i) below, the subject NQ and the object would no longer share the same maximal projection. If so, the ill-formedness of the standard examples would fail to be explained.

(i) [TP S [TP O [vP tO' [vP NQS [VP tO V ...]]]]

This means that in order to exclude standard examples such as (15a), the object has to stay and 'frozen' in the vP-edge.

problems with the so-called 'non-standard examples' (i.e., exceptions to the previous approaches) within the Locality approach, it has a certain 'arbitrariness' about it, in that it is not obvious (at least at the conceptual level) why the subject is merged in the vP for the non-standard cases (and leaves a trace), in contrast to the standard cases where it is directly merged in the TP (and lacks a trace). On this analysis, there is no apparent reason why they should take these particular patterns rather than some other ways, say, why not any other patterns? More fundamentally, it is questionable if they really have distinct basic structures as such from one another. In considering the fact that the standard- and the non-standard cases are built with the same lexical items and they are semantically related, it would be more desirable to derive one from the other. If the derivational approach is on the right track, by parity of reasoning, the obvious question we are forced to ask is, how the subject leaves a licensing trace for the non-standard examples, while it doesn't for the standard examples.[7]

Ⅴ. Direction to Further Research

Although the revised Locality provides a way of explaining the non-standard examples of subject scrambling, which posed a significant problem under the CL analysis, we have seen that it embeds some 'arbitrary' stipulations in it. On top of this, upon a close examination of the revised Locality, we surprisingly realize that the fundamental question, posed at the outset of this paper as regards a source of the subject-object asymmetry in licensing FNQs, is not yet resolved.

Note that on Ko's CL analysis, the asymmetry was understood as a consequence of and reduced to a single parameter called the Linear Preservation. Both the subject and the object are taken to uniformly merge inside the vP and to undergo further scrambling, the only

7. There is another mysterious trait in revised Locality analysis. In the standard derivation of (15), the object is 'trapped' inside the vP, unlikely in the non-standard cases where it scrambles further to TP required by the EPP on T. An obvious question is: how is it that the same object is stuck on the way in the former path when it freely passes through the potential 'freezing' site in the latter? Since this question is orthogonal to the main plot of this article, I will leave this important question aside.

difference being their possible or impossible property of vP-internal scrambling. Since the object, but not the subject, is within the search space of the probe *v*, vP-internal scrambling exclusively targets the object. This renders the object alone to afford to host an NQ, because its further movement to a higher phase domain would preserve linearization information about scrambling established at the previous vP-domain. This way, the CL provides a principled account for the asymmetries on the distribution of FNQs.

By contrast, the Locality approach is rather stipulative. It makes statements, rather than to supply a principled explanation. For instance, the subject and the object are merely described as different species; the subject is taken to optionally create a trace, so that it may or may not license its stranded NQs, while the scrambled object is to invariantly furnish a licensing trace. Their disparate characteristic of movement is a stipulation that does not follow from independent principles of the theory. The real heart of scrutiny then is, how we could give a principled account for the presence or absence of the traces for all these varying cases. We should abandon stipulations and instead deduce this and other non-trivial properties of scrambling from more fundamental principles of the languages. Any further studies, if aiming to attain an 'explanatory' adequacy in this area of research topic, must pay their first and foremost attentions in deriving this bewildering variety of trace patterns from a simple, principled theory.

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