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Floated numeral classifiers in Korean: A non-derivational, functional account

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Abstract

The syntactic and semantic complexity of the so-called numeral classifier (NUM-CL) constructions in languages like Korean (Japanese and Chinese as well) has been a considerable challenge to theoretical as well as computational approaches. Among several types of the NUM-CL constructions, the most complicated type includes the so-called FQ (floated numeral classifier/quantifier) construction where the NUM-CL 'floats' away from its antecedent. This paper, building on the non-derivational VP-modifier view, shows that in addition to the grammatical function of the host NP and types of the main predicate, properties of the intervening expression between the FQ and its host NP also play an important role in licensing the FQ's acceptability. In particular, we show that the FQ introduces new information in discourse and as default sets off rheme in the thematic structure. This functional analysis can provide an answer to several puzzling contrasts we observe in the distribution of the FQ.

Keywords: Stranding; VP-modifier; Thematic constraint; Numeral classifier; Functional; Theme; Rheme

1. The issues

There are at least three different environments where numeral classifiers (NUM-CL) in Korean can appear[1]:

(1) a. Genitive-Case (GC) Type:
[sey myeng-uy pemin-i] iss-ta
three CL-GEN criminal-NOM exist-DECL
'There are three criminals.'

b. Noun Initial (NI) Type:
[pemin sey myeng-i] iss-ta
criminal three CL-NOM exist-DECL

c. Floated Numeral Classifier or Quantifier (FQ) Type:
[pemin-i] [sey myeng] iss-ta
criminal-NOM three CL exist-DECL

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[1] The abbreviations used in the paper are as follows: ACC (accusative), CL (classifier), CONJ (conjunction), CONN (connective), COP (copula), COMP (complementizer), DECL (declarative), GEN (genitive), NOM (nominative), PST (past), PL (plural), DAT (dative), PNE (prenominal ending), TOP (topic), etc.

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Though these three types of NUM-CL construction behave similarly with respect to truth-conditional meaning, they are different in many syntactic and semantic/pragmatic respects.[2] In the GC type, the NUM-CL appears with genitive case marking, preceding the head noun *pemin* 'criminal' whereas in the NI type, the NUM-CL sequence follows the head noun. Meanwhile, in the FQ type, the head noun is case-marked, followed by the NUM-CL. In this case, the NUM-CL can further 'float' away from the associated NP:

(2) **pemin-i** cengmal **sey myeng** te iss-ta
criminal-NOM really three CL more exist-DECL
'There are really three more criminals.'

In this example, the NUM-CL *sey myeng* and its antecedent NP *pemin-i* are not adjacent, but are separated by the intervening adverb, *cengmal* 'really'.

In the FQ type there are several constraints on where the NUM-CL can be floated and with which argument the floated NUM-CL can be associated. For example, the NUM-CL canonically has a free distribution, like adverbial elements, but cannot precede its host NP (see Shi, 2000; Ko, 2007, among others):

(3) ***sey myeng** cengmal **pemin-i** te iss-ta
three CL really criminal-NOM more exist-DECL

Matters become complicated when an argument intervenes between the two. It has been noted in the literature that there is an asymmetry between subject and object (among others, see Kang, 2002; Ko, 2007 for Korean and Saito, 1985; Miyagawa and Arikawa, 2007 for the same paradigm in Japanese):

(4) a. ??/***haksayng-tul-i** chayk-ul **sey myeng** ilkessta
student-PL-NOM book-ACC three CL read
'(int) Three students read books.'
b. **chayk-ul** haksayng-tul-i **sey kwen** ilkessta
book-ACC student-PL-NOM three CL read
'Students read three books.'

The example (4a) tells us that the object cannot intervene between the subject and its NUM-CL whereas (4b) illustrates such an effect disappears when the subject intervenes between the scrambled object and its NUM-CL.

The generation of the GC and NI type is rather simple, but that of the FQ has been controversial.[3] There have been two main views in generating the FQ construction: stranding (adnominal) and VP-modifier (adverbial) view.[4] In the traditional

[2] Syntactically, numeral classifiers are a subclass of nouns. However, unlike common nouns, they cannot stand alone and must combine with a numeral or a limited set of determiners as in *(*twu*) *kay* 'two CL' (Numeral), *(*yele/myech*) *kay* 'several CL' (Quantifier), and *(*myech*) *kay* 'how many' (Interrogative) (there are a few exceptions: nouns like *salam* 'person' or *calwu* 'bag' can be used both as an independent common noun as well as a numeral). Semantically, there are tight sortal constraints between the classifiers and the nouns (or NPs) they modify. For example, *pen* can classify only events, *tay* machinery, and *kwen* just books. Such sortal constraints block classifiers like *tay* from modifying thin entities like books as in **chayk twu tay* 'book two CL'. Semantic constraints on the 10 most frequently used classifiers are given in the following (cf. Kim and Yang, 2007):

CL Type	Referents classified	Examples
kay	general objects	sakwa han kay 'apple one CL'
pen	events	nolay han pen 'song one CL'
myeng	person	haksayng han myeng 'student one CL'
pangwul	liquid	nwunmwul han pangwul 'tear one CL'
cang	flat objects	congi han cang 'paper one CL'
tay	machinery	cacenke han tay 'bike one CL'
ken	incidents	kyeyak han ken 'contract one CL'
mali	animals	saca han mali 'lion one CL'
ca	length	oskam han ca 'cloth one CL'

[3] See Kim and Yang (2007) for a detailed analysis implemented in a computational grammar and Choi (2011) for a minimalist view.

[4] In addition to these two, there is a hybrid view that allows both of the stranding and modifier view. Ko (2005, 2007) and Fitzpatrick (2006) support a hybrid approach in which the FQ functions either as an (stranded) adnominal or an adverbial expression. See footnote 10 also.

'stranding' view, the FQ construction is derived from the NI by moving the NP antecedent out of the VP, leaving the FQ and its trace behind (e.g., Sportiche, 1988; Koopman and Sportiche, 1991; Bošković, 2004 for English, Miyagawa, 1989; Miyagawa and Arikawa, 2007 for Japanese, Park and Sohn, 1993; Choi, 1988, 2001; Kim, 2005, for Korean). However, there are many facts arguing against this kind of movement assumption, and in favor of a base-generated VP-modifier view (e.g., Dowty and Brodie, 1984; Bobaljik, 2003 for English, Fukushima, 1991; Gunji and Hasida, 1998; Kuno and Takami, 2003 for Japanese, Shi, 2000; Kim and Yang, 2007 for Korean). In the VP-modifier view which we support here too, the ''floated-away'' NUM-CL is simply taken to modify a verbal predicate in situ and quantifies over the event that the VP denotes.

Even though there have been much discussion of the syntactic structure of the FQ constructions, not much attention has been paid to the question of why the NUM-CL float.[5] Why are the FQ and its host NP separated from each other? What functional purpose and benefit might there be for the floating? We look for the answers to these questions from a functional-grammar perspective. This paper in particular suggests that the main function of the floated NUM-CL is to introduce new information and, as a default, starts off rheme in the thematic structure. This functional approach, accompanied by the VP-modifier view, can explain puzzling contrasts the previous literature has observed with the FQ type. In so doing, in the next section, we will discuss the pros and cons of the two syntax-based (stranding and VP-modifier) views. In section 3, based on the observations that both syntax-based views are not enough to cover wider distributional possibilities of the FQ, we show how the functionally-motivated thematic structure can account for the phenomena in question.

2. Stranding and VP-modifier views

2.1. The stranding view and implications

Motivated to capture close (semantic) relationships among the three types, the traditional wisdom of dealing with the FQ type is to link the NI or GC type to the FQ type by movement operations:

(5) a. Mia-nun ceketo **chayk sey** **kwen-ul** ilkessta
Mia-TOP at least book three CL-ACC read
'Mia read three books at least.'
b. Mia-nun **chayk-ul** ceketo **sey** **kwen-(ul)** ilkessta
Mia-TOP book-ACC at least three CL-ACC read

For instance, the FQ type (5b) is derived from movement processes with the structural requirement of mutual c-command proposed by Miyagawa (1989):

(6) The FQ or its trace and the NP or its trace must mutually c-command each other.

Together with a ternary VP structure in which the FQ and the object are sisters, the two observe the locality requirement and then movement processes take place as illustrated in the following (see Miyagawa, 1989; Miyagawa and Arikawa, 2007 for Japanese and Park and Sohn, 1993; Choi, 2001; Kim, 2005 and Ko, 2007 for Korean).[6]

(7) Mia-nun [$_{VP}$ chayk$_i$-ul [$_{VP}$ ceketo [$_{VP}$ t$_i$ sey kwen-(ul) ilkessta]]]

The NP *chayk* 'book', being in the same local domain (e.g., mutually c-commanded in the ternary VP structure) with the NUM-CL '*sey kwen*', is moved out of the VP, stranding the NUM-CL in the original position.

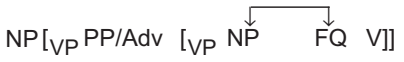
This locality condition in (6) specifies that the NUM-CL and its associate NP or trace need to be in the same local domain, and thus predicts the following three different realizations:

[5] Exceptions are Kim (1988) and Han (2000) for Korean, Gunji and Hasida (1998), Kuno and Takami (2003), and Amazaki (2005) for Japanese. They all pointed out the importance of functional aspects in using the FQ as I illustrate in this paper.

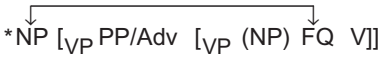
[6] Departing from Miyagawa (1989), Miyagawa and Arikawa (2007) posit a binary VP structure in which the NP and the FQ make up a single constituent to observe the locality requirement between the two.

(8) a. Unaccusative/passive:

b. Object of transitive:



c. Unergative/subject of transitive:



As seen in (8a), the subjects of passive and unaccusative are base-generated in the VP and their traces and FQ can be in the mutual c-command relation. As in (8b), the object of a transitive and its FQ are in the same legitimate relation. However, the subject of an unergative verb cannot be in the mutual c-command relation with the FQ as shown in (8c). Observe the following contrast between unaccusative and unergative (data from Ko, 2007):

(9) a. koyangi-ka pyeng-ulo sey mali cwukessta
cat-NOM illness-of three CL died
'Three cats died of illness.'

b. ?*haksayng-tul-i caki-uy ton-ulo twu myeng cenhwahayessta
student-PL-NOM self-GEN money-with two CL phoned
'Two students made a phone call with their own money.'

In the stranding view, the subject of the unaccusative verb *cwukessta* 'die' is base-generated in the object position, adjacent to the NUM-CL. Moving the subject out of this VP, stranding the NUM-CL, will still meet the strict locality requirement between the two. However, the subject of the unergative verb 'phoned' in (9b) is base-generated outside the VP (as illustrated in (8c)) and thus cannot be in a mutual c-command relation with the NUM-CL.

The contrast between subject and object also follows in a similar manner. Consider the following Korean data from Ko (2007):

(10) a. **maykcwu-lul** haksayngtul-i **sey** **pyeng** masiessta
beer-ACC students-NOM three CL drank
'Students drank three bottles of beer.'

b. ?***haksayng-tul-i** maykcwu-lul **sey** **myeng** masiessta
students-NOM beer-ACC three CL drank
'Three students drank beer.'

As seen from the contrast here, the object and its associate NUM-CL in (10a) can be separated by the subject whereas the subject and its linked NUM-CL in (10b) cannot be separated by the object. The ungrammaticality of (10b) follows from the fact that the subject of a transitive verb cannot leave the linked NUM-CL behind since it would violate the strict locality condition.[7]

The stranding view may also get support from the contrast in the following (data from Ko, 2007):

(11) a. haksayngtul-i sey myeng Mary-eykey maykcwu-lul cwuessta
students-NOM three CL Mary-DAT beer-ACC gave
'Three students gave beer to Mary.'

b. ?*haksayngtul-i Mary-eykey sey myeng maykcwul-lul cwuessta

As noted by Miyagawa (1989) and Ko (2007), a VP internal argument cannot split the subject and its associate NUM-CL, since this would mean the two are not in a mutual c-command relation.

The stranding view linking an FQ and its host NP by movement may also capture the agreement between the NUM-CL and its associate NP. One of the main constraints on the association between the NUM-CL and its antecedent NP is case

[7] Together with the VP-internal subject hypothesis, this analysis assumes that the subject does not scramble at all and thus cannot move to the left of the object. Refer to Saito (1985) and Miyagawa (1989) for the same approach and to Ko (2007) for a different view.

agreement. For example, the case marked NUM-CL needs to have identical case marking with its associated NP (see, among others, Gerdts, 1987; Choi, 2001; Ko, 2007):

(12) **haksayng-tul-i** ecey **sey** **myeng-i/*lul** maykcwu-lul **twu** **pyeng-ul/*i** masiessta
student-PL-NOM yesterday three CL-NOM/*ACC beer-ACC two CL-ACC/*NOM drank
'Three students drank two bottles of beer last night.'

Given that the FQ and its host NP form a constituent in the same local domain from the beginning, the case agreement between the FQ and its host NP can be easily expected (see section 2.3 for further discussion).

In addition, as a reviewer pointed out, the stranding view may capture the fact that the NUM-CL cannot precede its host NP. Given that the NUM-CL is a head and forms a constituent with its host NP (reflecting the head-finalness of the language), the ungrammaticality of (13b) may follow because of an illegitimate movement of the head (cf. Ko, 2007)[8]:

(13) a. cengmal photocwu-ka nayngcangko-ey **sey** **pyeng** iss-ney
really wine-NOM refrigerator-at three NUM-CL exist-DECL
'There are really three bottles of wine in the refrigerator.'
b. ***sey** **pyeng** cengmal photocwu-ka nayngcangko-ey iss-ney
three CL-NUM really wine-NOM refrigerator-at exist-DECL

In sum, the stranding view, as we have seen so far, appears to be appealing in capturing many assumed contrasts. However, issues also arise from empirical data. For example, as we will see in what follows, there are ample cases where the assumed (subject/object, unaccusative/unergative) asymmetries we have seen so far disappear if proper context is given. This hints that the grammar cannot rule out the assumed, unacceptable asymmetric sentences, but should also consider factors such as discourse and language processing. In addition, there are many syntactic, semantic, and pragmatic differences among the three types. If these differences really exist and if we try to link the FQ type to the NI or GC type, movement approaches then are required to assume that movement accompanies semantic/pragmatic differences, contrary to its traditional wisdom.[9] In what follows, we will show that case agreement and distributional possibilities can be captured without resorting to movement operations, while relegating the asymmetries to functional constraints (see section 3).[10]

2.2. The VP-modifier view

Unlike the stranding analysis, the VP modifier view assumes that there is no transformational relation between the NI or GC and FQ version (Fukushima, 1991; Gunji and Hasida, 1998 for Japanese, Kang, 2002 and Kim and Yang, 2007 for Korean). Contrary to the stranding view, the VP-modifier view assumes that the NUM-CL (i) directly combines with a verbal predicate in syntax in the form of a head-modifier structure and (ii) semantically modifies the event structure of the predicate, as simply represented in the following:

(14) pemin-i cengmal [$_{VP}$ **sey** **myeng** [$_{VP}$ te iss-ta]]
criminal-NOM really three CL more exist-DECL
'There are really at least three more criminals.'

In the VP-modifier view, as long as the FQ forms a head-modifier construction with the verbal predicate that follows, its distribution is licensed. This predicts the distributional possibilities of the NUM-CL or the FQ are similar to those of other canonical adverbial elements (see section 2.3 for the relevant constraints). In addition, since there are no direct links between the FQ type with the GC and NI types, we expect they may behave differently with respect to syntactic as well as semantic aspects.

[8] Examples like (13b) might be improved in Japanese or in Korean but not in Chinese when there is a long pause after the NUM-CL or a delimiter marker like *-ina* attached to it (see Saito et al., 2008 for Japanese and Kang, 2002 and Ko, 2005 for Korean). This indicates that in an informal or spoken style, a special discourse effect (e.g., topicalization) may license the FQ to be in the sentence initial position. See Saito et al. (2008) for an ellipsis anlaysis or Ko (2005) for a cyclic linearization analysis.

[9] As an anonymous reviewer points out, the arguments against the stranding view set forth here may not hold for the analysis where movement operations can accompany meaning differences in a given environment (see Watanabe, 2006 for Japanese). In such a view, the issues arising from linking the three different types or moving around either the FQ or the associated NP here may disappear, but questions still remain unanswered as to the validity of movement operations to accompany non-monotonic semantic or pragmatic changes.

[10] Another direction is to adopt a hybrid approach as assumed by Kang (2002), Fitzpatrick (2006), Ko (2007), and Ko and Oh (2010) in which the FQ can function either as an adnominal or as an adverbial. The main motivations for the hybrid analysis stem from the ambiguous status of FQ in terms of syntax and semantics. For example, Fitzpatrick (2006) shows that on one hand the FQ behaves like an adverbial Q (A-movement like properties of the host noun), but on the other hand it acts like a stranded Q (A′-movement like properties). For detailed arguments for the hybrid analysis, refer to this literature.

We can first observe that the three NUM-CL types are different concerning constituenthood. For example, cleft examples show that in the NI and GC type, the host noun forms a syntactic unit together with the NUM-CL whereas in the FQ, it does not (see Shi, 2000; Choi, 2001):

(15) a. ku sensayngnim-ul mos ka-key ha-n kes-un [sey myeng-uy haksayng]-i-ess-ta. (GC Type)
that teacher-ACC not go-CONN do-MOD thing-PNE three CL-GEN student-COP-PAST-DECL
'What made the teacher not leave were five students.'

b. ku sensayng-nim-ul mos ka-key ha-n kes-un [haksayng sey myeng]-i-ess-ta. (NI Type)
that teacher-ACC not go-CONN do-MOD thing-MOD student three CL-COP-PAST-DECL

c. *ku sensayng-nim-ul mos ka-key ha-n kes-un [haksayng-i sey myeng]-i-ess-ta. (FQ Type)
that teacher-ACC not go-CONN do-MOD thing-MOD student-NOM three CL-COP-PAST-DECL

The contrast here indicates that in the FQ, the NUM-CL does not form a syntactic unit with the host NP. Within an analysis where the NP and the associate NUM-CL form a constituent as in Miyagawa and Arikawa (2007), this behavior would not be expected.[11]

Coordination shows us another difference with respect to constituenthood; the GC and the NI type can participate in coordinate constructions, but the FQ type cannot:

(16) a. Kim-un [[sey kwen-uy kongchayk]-kwa [twu calwu-uy yenphil]]-ul sassta.
Kim-TOP three CL-GEN notebook-CONJ two CL-GEN pencil-ACC bought
'Kim bought three notes and two pencils.'

b. Kim-un [[kongchayk sey kwen]-kwa [yenphil twu calwu]]-lul sassta
Kim-TOP notebook three CL-CONJ pencil two CL-ACC bought

c. ??*Kim-un [[kongchayk-ul sey kwen]-kwa [yenphil-ul twu calwu]] sassta.
Kim-TOP notebook-ACC three CL-CONJ pencil-ACC two CL bought

As we have seen, the GC and NI type behave much alike in terms of constituenthood, but the FQ is different. Each type has its own grammatical features, seen in the following contrast:

(17) a. ?[sey kwen-uy kongchayk]-kwa [yenphil twu calwu]
three CL-GEN notebook-CONJ pencil two CL

b. ??*[kongchayk-i sey kwen]-kwa [yenphil twu calwu]
notebook-NOM three CL-CONJ pencil two CL

c. ??*[kongchayk-i sey kwen]-kwa [two calwu-uy yenphil]
notebook-NOM three CL-CONJ two CL-GEN pencil

(17a) is the coordination of a GC and an NI type while (17b) is that of an FQ type with an NI and (17c) is that of an FQ with a GC type. The contrast here clearly shows that the FQ type is quite different from the other two types, displaying its own constructional properties while sharing some with the other two. Given that unlike the GC and NI, the FQ type is a modifier construction in which an FQ and its host do not form a constituent, these contrasts follow easily.

Additional support for this adverbial view can be found from the substitution by *kuli-ha-ta* 'so-do-DECL' together. As noted in (18), unlike the NI type, only the FQ type allows a NUM-CL and a following main verb together to be substituted by the pro-verb *kulay-ss-ta* (see Shi, 2000)[12]:

(18) a. ilpwule ecey namhaksayng-tul-i [sey myeng o-ass-ko], yehaksayng-tul-to
deliberately yesterday male.student-PL-NOM three CL come-PAST-CONJ female.student-PL-also
kulay-ss-ta
do-PAST-DECL
'Deliberately, three male students came yesterday, and as for female students, they did the same'

b. ??/*ilpwule [namhaksayng-tul sey myeng-i] ecey o-ass-ko, yehaksayng-tul-to [kulay-ss-ta]

[11] As a reviewer points out, the stranding view may account for the cleft and coordination data here with the assumption that the precopular NP *haksayng* 'student' in (15c) and *yenphil* 'pencil' in (16c) cannot get case. However, note that examples like (15c) and (16c) are acceptable in Japanese, leading Miyagawa and Arikawa (2007) to assume that the NP and the FQ form a constituent. This implies that the two languages cannot have the same assumption for the FQ's constituenthood.

[12] As a reviewer noted, the expression *kulay* has some deep anaphor properties, which may weaken the argument here. However, it also has surface anaphor properties in that it requires a linguistic antecedent.

This means that the floated NUM-CL forms a VP with the following predicate, whereas this is not true with the NUM-CL in the NI type. Within a stranding view, one may argue that the subject *namhaksayng* 'male.student' is generated in a VP-internal position and moved to the Spec of IP/TP. This would then make the bracketed part in (18a) a constituent, and possibly licensing the pro-verb substitution. This assumption also would make (18b) also strange since the subject and the remaining VP does not form a constituent. However, note that this assumption needs to introduce an additional mechanism (e.g., the subject might stay within the VP domain below an lower adverb) since the subject is below the lower VP adverb *ilpwule* 'deliberately' in both cases (cf. Ko, 2007). It is true that the coordination and substitution facts described here can be accounted for within movement perspectives, but one thing worth noting is that the sentences or phrases with FQ are different from those with NI or GC. The observations here thus indicate what matters more is the surface position of the NUM-CL, not syntactic operations.

In addition to these syntactic differences, the FQ type behaves differently from the other two types in semantic and pragmatic respects too. For example, unlike the GC and NI type, the FQ construction prefers a partitive reading (see Kim, 2005 for Korean and Nakanishi, 2008 for Japanese). Consider the following set of data:

(19) a. Seoul-lo tomangka-n tases myeng-uy haksayng-i tolawassta
Seoul-to run-away-PNE five CL-GEN student-NOM returned
'The five students who ran away for Seoul returned.'
b. Seoul-lo tomangka-n haksayng tases myeng-i tolawassta.
Seoul-to run-away-PNE student five CL-NOM returned
'The five students who ran away for Seoul returned.'
c. Seoul-lo tomangka-n haksayng-i tases myeng-(i) tolawassta.
Seoul-to run-away-PNE student-NOM five CL-NOM returned
'Of those who ran away for Seoul, just five returned.'

The examples (19a) and (19b) are true in the situation where there are five students who left for Seoul, and they all came back. Meanwhile, the preferred reading of (19c) is such that there are more than five students who left for Seoul and of them just five returned, thus licensing a partitive reading here.

We can also observe a difference in specific and nonspecific reading. The NI allows either a specific or nonspecific reading whereas as default the FQ allows only a nonspecific reading (see Lee, 1989; Kim, 2005)[13]:

(20) a. pemin twu myeng-i ecey tomangkassta
criminal two CL-NOM yesterday ran.away
'Two (specific or nonspecific) criminals ran away yesterday.'
b. pemin-i ecey twu myeng-i tomangkassta
criminal-NOM yesterday two CL-NOM ran.away
'Of the criminals, two (nonspecific) ran away.'

As given in the English glosses here, in the NI type, the two criminals can be either specific or nonspecific whereas in the FQ, they can be only nonspecific. With respect to this reading, (20b) can be interpreted as having a partitive and nonspecific reading such that there is a set of criminals and of the members in this set, two unspecific criminals ran away. No such reading is available in the NI type (or the GC) type unless supported by an additional scope marking expression like like *ta* 'all'.

In a similar fashion, the FQ construction behaves differently from the other two types with respect to scope. Unlike the NI type, the FQ construction allows only a narrow scope reading as default (see Kim, 2005)[14]

[13] For space reasons, we discuss only the NI type when the NI and GC types behave alike.

[14] As a reviewer points out, the addition of a scope marker like *ta* 'all' will change the scope possibility:

(i) FQ Type: ∀3 > WANT or WANT > ∀3
[pemin-i] [sey myeng-(i)] **ta** caphi-ki-lul palan-ta
criminals three-CL-NOM all arrest-NMLZ-ACC want-DECL
'(We) want all of the three criminals to be arrested.'

In this example, as shown in the English translation, the adverb *all* and the numeral classifier together function as a universal quantifier, inducing scope ambiguities with the intensional predicate.

(21) a. NI Type: ∃3 > WANT or WANT > ∃3
[pemin sey myeng-i] caphi-ki-lul palan-ta
criminal three-CL-NOM arrest-NMLZ-ACC want-DECL
'(We) want three criminals to be arrested'

b. FQ Type: *∃3 > WANT or WANT > ∃3
[pemin-i] [sey myeng-(i)] caphi-ki-lul palan-ta
criminals three-CL-NOM arrest-NMLZ-ACC want-DECL
'(We) want three of the criminals to be arrested.'

Depending on the specificity of the criminals, in the NI sentence (21a), 'three criminals' can have wider or narrower scope of the intentional predicate 'want'. However, in the FQ where we have only a nonspecific reading, the criminals cannot have wider scope.

An additional difference is observed with respect to distributivity. That is, the NI allows both a distributive or collective reading whereas the FQ licenses a distributive reading only (see Nakanishi, 2008 for Japanese and Lee, 1989 for Korean):

(22) a. **[ceyca-tul twu myeng]-i** ecey kyelhonha-yess-ta
pupil-PL two CL-NOM yesterday marry-PAST-DECL
'Two students married yesterday.' (distributive or collective)

b. **[ceyca-tul-i]** ecey **[twu myeng-i]** kyelhonha-yess-ta
pupil-PL-NOM yesterday two CL-NOM marry-PAST-DECL
'Two pupils married yesterday.' (distributive only)

In (22a), the pupils can get married separately or married each other whereas those in (22b) can be only married separately. The FQ type is interpreted with a distributive reading while the other non-floated cases are ambiguous as to distributive and collective readings.

As we have seen, there are many syntactic as well as semantic, pragmatic differences among the three NUM-CL types. In particular, the FQ type is peculiar in many respects. These differences may be captured by the stranding view too, but it seems that the surface-oriented VP-modifier view can provide a simpler analysis for the phenomena discussed.

2.3. More on the VP modifier view

The VP-modifier view encounters two important questions: if we treat an FQ as a type of VP-modifier, how can we capture its differences from canonical VP-modifiers? More importantly, this view encounters the question of how to link the FQ with its associated NP in a remote position without movement operations. We argue here that the core grammatical functions (subject and object) play important role in linking the two expressions.

There are several constraints in identifying the antecedent of an FQ. One important constraint is case agreement: When the floating quantifier is case-marked, it is linked to the subject or object with the same case marking (see O'Grady, 1982; Gerdts, 1987, and Choi, 2001):

(23) a. haksayng-tul-i **sey myeng-i/*ul** sakwa-lul cengmal mek-ess-ta
student-PL-NOM three CL-NOM/ACC apple-ACC really eat-PAST-DECL
'As for the students, three really ate apples.'

b. haksayng-tul-i sakwa-lul **sey myeng-i/*ul** cengmal mek-ess-ta

c. haksayng-tul-i sakwa-lul cengmal **sey myeng-i/*ul** mek-ess-ta

(24) a. haksayng-tul-i sakwa-lul **sey kay-lul/*ka** cengmal mek-ess-ta
student-PL-NOM apple-ACC/NOM three CL-ACC really eat-PAST-DECL
'As for the apples, three really ate three.'

b. sakwa-lul haksayng-tul-i **sey kay-lul/*ka** cengmal mek-ess-ta

c. haksayng-tul-i sakwa-lul cengmal **sey kay-lul/*ka** mek-ess-ta

Regardless of its location, we can observe that the NOM FQ is linked to the subject whereas the ACC-marked FQ is linked to the object.[15]

More complicated phenomena occur in raising and causatives where the FQ and its antecedent have different case values. In raising constructions, the ACC-marked raising NP argument can take either a NOM or ACC-marked FQ as its modifiee. When the embedded subject is raised as the matrix object in (25b), both NOM and ACC-marked FQ can be the antecedent of the raised object (see Gerdts, 1987)[16]:

(25) a. John-i haksayng-i sey myeng-i/*ul chencay-i-lako mitessta.
John-NOM student-NOM three CL-NOM/*ACC genius-COP-COMP believed
'John believed that three students are genius.'
b. John-i haksayng-ul **sey** **myeng-i/ul** chencaylako mitessta
John-NOM student-ACC three CL-NOM/ACC genius-COP-COMP believed

Causative constructions also show similar behavior. The causee can be NOM, DAT, or ACC in Korean causative constructions, but there are restrictions on the FQ:

(26) a. sensayngnim-i haksayng-tul-i sey myeng-i/*ul/*eykey ttena-key hayessta
teacher-NOM student-NOM three CL-NOM/*ACC/*DAT leave-COMP did
'The teacher made three students to leave.'
b. sensayngnim-i haksayng-tul-eykey **sey** **myeng-i/*eykey** ttena-key hayessta
teacher-NOM student-PL-DAT three CL-NOM/*DAT leave-COMP did
c. sensayngnim-i haksayngtul-ul **sey** **myeng-i/ul/*eykey** ttena-key hayessta
teacher-NOM student-ACC three CL-NOM/*ACC/*DAT leave-COMP did

The intriguing fact is that unlike in the general case, the DAT causee in (26b) can be the antecedent of the FQ. In addition, as given in (26c), the FQ can be either NOM or ACC even though its antecedent ('student') is ACC-marked. What these raising and causative constructions indicate is that, as pointed out by Gerdts (1987) and others, linking an FQ with its antecedent cannot simply refer to the case marking value of the two expressions: it needs to check the grammatical function of the putative antecedent.

(27) FQ Linking Rules in Korean:
a. A case-marked FQ is associated with a core argument NP in the same case marking.
b. A non-case marked FQ is associated with a core argument matching in agreement features.

The rule in (27a) will block examples where the FQ and its putative antecedent are marked with different case values. Meanwhile, these rules will license all the possible associations in examples like the following[17]:

(28) a. haksayng-tul-i tayhak-ul seys-(man) pangmwunha-yess-ta
student-PL-NOM university-ACC three-only visit-PAST-DECL
'The students visited three universities' or
'Three students visited the university.'
b. haksayng-tul-i tayhak-ul seys-(man) iphakha-yess-ta
student-PL-NOM university three-only enter-PAST-DECL
'Only three students entered university.'

[15] There is variation among speakers in accepting the DAT marking on the FQ, but the indirect object with the DAT case marking cannot be the antecedent of an FQ (see Gerdts, 1987; Kwak, 1995):

(i) a. haksayng-tul-i ku phyenci-ul sensayngnim ney pwun-eykey ponayessta.
student-PL-NOM that letter-ACC teacher four CL-DAT sent
'Students sent the letter to four teachers.'
b. *haksayng-tul-i phyenci-lul sensayngnim-eykey neypwun-eykey ponayessta.
c. *haksayng-tul-i phyenci-lul sensayngnim-eykey cinancwumal-ey neypwun-eykey ponayessta.
d. ?haksayng-tul-i phyenci-lul sensayngnim-ul cinancwumal-ey neypwun-ul ponayessta.

However, when the goal argument has ACC only as in (id), the argument can serve as the FQ's antecedent.

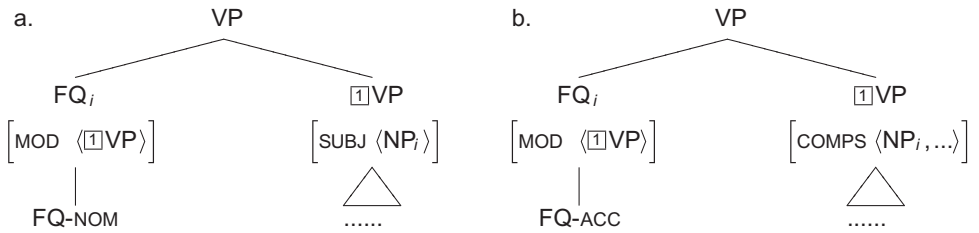
[16] In the present analysis where the case-marked FQ is linked to either the SUBJ or a COMPS element, we can expect these case variations. To put it in an informal way, when the FQ is nominative-marked, it modifies a VP with the subject value unsaturated. But since the subject is raised as the object and bears the ACC value, the case mismatch is licensed. See Kim and Yang (2007) and the references therein for further discussion.

[17] As a reviewer points out, the preferred reading for (28a) would be the one where the students visited 'three' universities. For the second reading such that 'three' students visited a university, we may need an additional contextual clue that assigns a highlighted information on the number of the students, which is what this paper also argues for.

The numeral *seys* 'three' with no classifier in (28a) can be linked to either the subject or object, though the latter, closer to the FQ, is preferred (a long pause after the FQ makes it easier to link the FQ with the remote subject). As illustrated in (28b), other contextual or grammatical factors can disambiguate between the two possible antecedents. That is, when we talk about entering university, we are in general concerned about the number of students, not the number of universities. This is why in (28b) the preferred antecedent is the subject. These facts tell us that we need to have a flexible linking system where core grammatical functions are visible.

There may be several different ways of formalizing the generalizations in (27). In this paper, we follow that of Kim and Yang (2007) which has been computationally implemented in a successful way. That is, we assume that the FQ is an adverbial nominal anaphorically linked to the host through the VAL (valence) features on the modified VP as represented in the following configurational-style, informal way[18]:

(29) Formalized Constraints on the Linking between a FQ and its Host

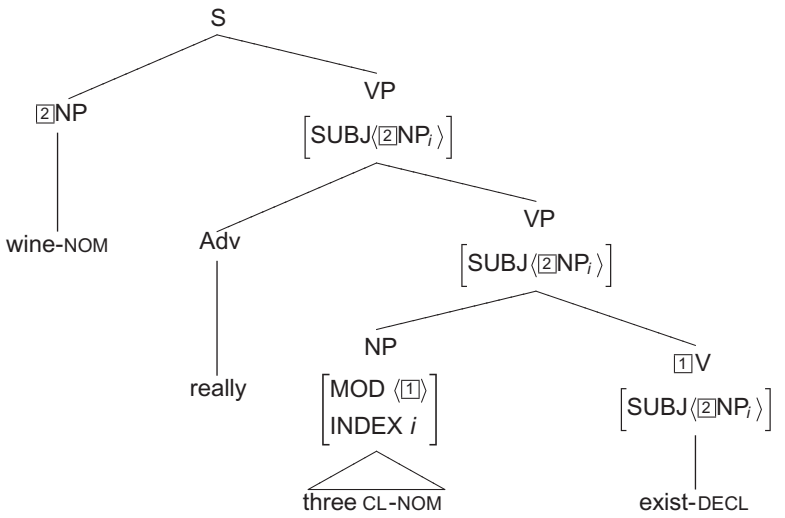


What these two constraints indicate is that the nominative-marked FQ modifies (MOD) a verbal element whose subject (SUBJ) is unsaturated whereas the accusative-marked FQ modifies a verbal element whose object complement is still unsaturated. In these two configurations, we can note that the additional constraint is that the unsaturated grammatical function can be coindexed with the FQ.

In order to see how this system works, let us then consider a simple example in which the FQ is not adjacent to its antecedent NP[19]:

(30) a. photocwu-ka cengmal sey pyeng-i iss-ney
wine-NOM really three CL-NOM exist-DECL
'There are really three bottles of wine.'

b.



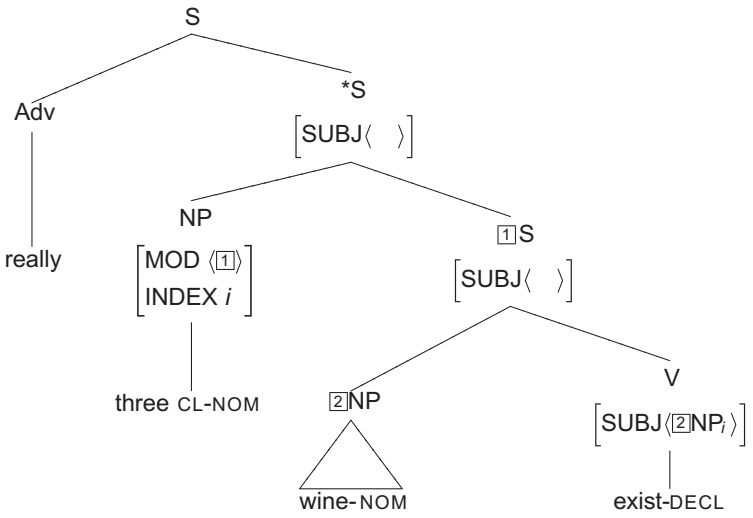
[18] The valence features include SUBJ (subject) and COMPS (complements) required by a lexical head. This valence value is discharged when it is combined with a lexical or phrasal head. The boxed number indicates the structure sharing between two elements. See Sag et al. (2003), Kim (2004), and Kim and Sells (2008) for the feature formalism and mechanism within the constraint-based grammar of HPSG.

[19] Within the present system, there is thus feature-sharing between the FQ and its associated NP. This kind of feature-sharing is believed to be similar to an Minimalist idea developed by Ko (2009) where there is T-feature sharing between the two.

Note that in the linking constraints (29), it is crucial that the FQ refers to the unsaturated SUBJ value of the matrix verb. If the subject is saturated, then the FQ does not have any NP to be coindexed with. In (30b), the FQ 'three CL-NOM' modifies a VP that still looks for a subject. This subject is correctly linked with the FQ 'three-CL-NOM'.

However, this simple analysis, referring to the grammatical function of the VP a FQ modifies, does not license examples like the following where the FQ precedes its host NP[20]:

(31) a. *cengmal sey pyeng-i photocwu-ka iss-ney
really three CL-NOM wine-NOM exist-DECL
b.



Here, the FQ *sey pyeng-i* modifies a verbal expression, but note that the modified verbal expression is already saturated with the subject element. There is thus no element we can link the FQ with.

Note that this system implies that when the FQ is caseless or delimiter-marked, it can be linked either to the subject or the object as long as discourse licenses it. As seen in (10) and repeated in (32a), the subject can intervene between the FQ and its host. Then, in terms of syntax, we would generate examples like (32b):

(32) a. **maykcwu-lul** haksayngtul-i **sey** **pyeng** masiessta
beer-ACC students-NOM three CL drank
'Students drank three bottles of beer.'
b. **chinkwu-lul** haksayngtul-i [$_{VP}$ **sey** **myeng**-ina [$_{VP}$ mannassta]]
friend-ACC students-NOM three CL-even met
(intended) 'Students met three friends.'
but (interpreted) 'Three students met the friend.'

Even though the syntax (in the stranding view) may license the link between the FQ with the sentential object in (32b), the intervening subject blocks this: the default link here is the FQ with the subject. In the present analysis, when the FQ modifies the verbal predicate 'met', it looks for an unsaturated arguments: both the subject and the object are available as the FQ's host since both are unsaturated at this VP level. This again supports our position in this paper that the intervening expression between the two also plays an important role in licensing the distribution of the FQ (see section 3 for further discussion).

Even though we treat the FQ as a VP-modifier, this does not mean that the FQ will behave like a canonical adverbial expression as hinted at (31). As a reviewer pointed out, adverbs like frequency adverbials that can be optionally case-marked can occur almost in any place within a clause, but an FQ cannot. Observe the following data set:

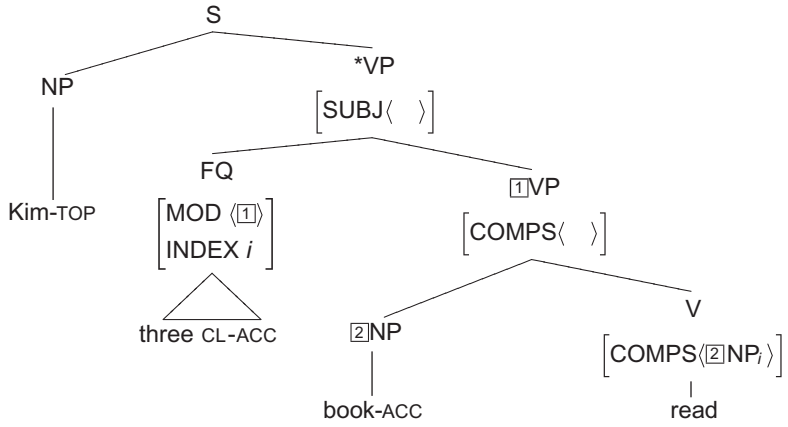
[20] As noted earlier in footnote 8, a caseless FQ in Japanese and a delimiter-marked FQ may precede its associate NP in the topicalized position with a phonological pause. See the end of section 4 for further discussion.

(33) Frequency Adverbial:
a. Kim-un chayk-ul **sey pen-(ul)** ilkessta.
Kim-TOP book-ACC three times-ACC read
'Kim read the book three times.'
b. Kim-un **sey pen-ul** chayk-ul ilkessta
c. **sey pen-ul** chayk-ul Kim-un ilkessta.

(34) FQ:
a. Kim-un chayk-ul **sey kwen-(ul)** ilkessta.
Kim-TOP book-ACC three CL-NUM-ACC read
'Kim read three books.'
b. *Kim-un **sey kwen-ul** chayk-ul ilkessta
c. ***sey kwen-ul** chayk-ul Kim-un ilkessta.

As noted here in the contrast, the frequency adverbial appear in any place, whereas the FQ cannot precede its host NP. In the present analysis, this contrast follows in a straightforward manner. Consider the structure of (34b) in the present analysis:

(35)



The accusative marked FQ *sey kwen-ul* three CL-ACC modifies a VP, but note that this VP is already saturated with its COMPS (object) value. This makes the FQ impossible to link or coindex itself with a grammatical function: That is, the INDEX value of its host NP is invisible to the FQ. The ungrammaticality of (34b) or (34c) thus can follow in a simple manner.

As we have seen, the VP-modifier view can also provide a simple way of linking the FQ with its remote host NP by referring to the local valence features such as SUBJ and COMPS. This syntactic linking requirement can also lead us to a simpler account for the contrast between FQs and frequency adverbs. This implies that the distributional possibilities of the adverbial FQ and the issue of linking the FQ with the host NP are no longer strong motivations for the stranding view only: the VP-modifier view can serve as a viable alternative.

2.4. Summary

As we have seen so far, the stranding view derives the FQ type by movement operations under a locality requirement whereas the VP-modifier posits no transformational operations but captures the relationship just by a head-modifier relation. Each of these two views has its own merits as summarized in the following (see Fitzpatrick, 2006 also):

(36) Advantages of the stranding view:
a. Captures semantic similarity to non-FQ types, GC, and NI.
b. Explains subject/object, unergative/unaccusative asymmetries.
c. Accounts for the linking relationship and agreement between an FQ and its host NP.

(37) Advantages of the VP-modifier view:
a. Implies much wider distributional flexibilities of the FQ.
b. Predicts semantic and pragmatic differences of the FQ type.

It is also true that each of the two views has its own obstacles to overcome. That is, the stranding view needs to account for the semantic and pragmatic differences of the FQ type from the other two NUM-CL types and explain why in a proper context the claimed asymmetries disappear. On the other hand, the VP-modifier view predicts wider distributional possibilities but needs to answer why we have certain claimed asymmetries and further requires to explain how to link an FQ with its host NP in a natural way. Of course, each view may have a way to overcome these issues. However, when we consider more data, one thing that is clear is that syntax alone is not enough to capture wider distributional possibilities of the FQ as well as speakers' variations in the judgements of FQ data. The most serious challenge to both of these syntax-based views is the question of why the FQ 'floats'. In what follows, we try to answer this question.

3. Information structure and FQ

3.1. FQ as a focus marker

As suggested by the literature (see, among others, Kim, 1988, 2004; Han, 2000, for Korean and Downing, 1993; Kuno and Takami, 2003; Amazaki, 2005 for Japanese), the use of an FQ is closely linked to the introduction of new information.

The first thing we can observe in the uses of the FQ is that as the unmarked answer to a wh-question asking the quantity of something, Korean prefers the FQ type, rather than the GC or NI type (see Amazaki, 2005 for Japanese). Observe the following[21]:

(38) A: Mimi-nun kongchayk-ul **myech kwen** sa-ss-ni?
Mimi-TOP notebook-ACC how CL buy-PAST-Q
'How many notebooks did Mimi buy?
B: kongchayk-un **sey kwen** sa-ss-e
notebook-TOP three CL buy-PAST-DECL
'As for notebooks, she bought three.'
B′: **#sey kwen-uy** kongchayk-ul sa-ss-e (GC)
three CL-GEN notebook-ACC buy-PAST-DECL
B″: #kongchayk **sey kwen-ul** sa-ss-e (NI)
notebook three CL-ACC buy-PAST-DECL

If the question A is given out as a starting point of a dialogue, the most natural answer to this is the FQ type B. The GC (B′) or NI (B″) type might be accepted with more context or other factors, but the FQ type is preferred as introducing the quantity of an entity as new information. The unnaturalness of B′ and B″ is thus related to incongruence between question–answer pair. The question asks the quantity of the notebooks and the most appropriate answer is the one that provides information for this question.

In a similar fashion, the FQ, used as partitive of the given set, is felicitous when it introduces the quantity/number as new information. In the following, the information (the number is two) that the floated NUM-CL gives us is new, but the existence of tigers is given:

(39) A: i tongmwulwen-ey saca-wa holangi-ka **yele mali** issesse
the zoo-at lion-and tiger-NOM several CL existed
'In the zoo, there were several lions and tigers.'
B: kulentey holangi-ka ecey **twu mali** tomangkasse
but tiger-NOM ecey two CL ran.away
'But two of the tigers ran away yesterday.'

The data once again show that the FQ is introduced in context where the information about the number which it carries is new. This in turn means that the FQ is not preferred as old information. Observe the following constructed context which we can often find in a children's storytelling book:

[21] As a reviewer notes, if the question has a non-FQ form, the same non-FQ form can be natural as its answer:

(i) Mimi-nun **myech kwen**-uy kongchayk-ul sa-ss-ni?
Mimi-TOP how CLGEN notebook-ACC buy-PAST-Q
'How many notebooks did Mimi buy?

To the question including the GC, the same GC form (38)B′ can be an felicitous answer. But note that the FQ (e.g., (38)B) can be also felicitous but not the NI form (38)B″. In this sense, the FQ form appears to be most unmarked one.

(40) A: han san sok maul-eyse **holangi twu mali-ka** salasse.
one mountain inner village-at tiger two CL-NOM lived
'In a deep mountain, two tigers lived.'
B: i **holangi twu mali-ka** sanayng-ul nakasse
this tiger two CL-NOM hunting went.out
'These two tigers went out for hunting.'
B′: #i **holangi-ka twu mali** sanayng-ul nakasse
this-PL tiger-NOM two CL hunting went.out
'Two tigers went out for hunting.'

The information on the number (two) of the tigers is given by A. The weirdness of B′ shows that unlike the NI type, the FQ type does not relate to the information already established, since this type prefers to evoke novel information, not information already established in the discourse.

This position further predicts that the FQ is excluded in contexts where the number of referents concerned is already implied. Observe the following:

(41) a. ??/*Mia-nun pwumonim-ul Seoul-eyse **twu pwun** mosi-ko isse
Mia-TOP parents-ACC Seoul-at two CL take.care-CONN exist
'Mia attends to her two parents in Seoul.'
b. ??/*Mia-nun sonkalak-ul ecey **yel kay** tachiessta
Mia-TOP finger-ACC yesterday ten CL hurt
'Mia hurt her ten fingers.'

The lexical property of the expression *pwumonim* 'parents' invariably designates two persons, father and mother, which makes it hard to introduce the FQ as new information. The same goes for the number of our fingers. The number ten is already implied by world knowledge. As such and noted by Kim (1988), the FQ sounds infelicitous when the conventional implicature already provides the quantity information linked to the FQ.

The default focus reading for the FQ can also be observed in the use of the FQ in island environments. Note that it is less acceptable to have an FQ within a complex NP:

(42) A: sensayngnim-i etten phyenci-lul ilkessni?
teacher-NOM what letter-ACC read-PAST-QUE
'What kind of letter did the teacher read?
B′: sensayngnim-un [[**twu myeng-uy** haksayng-i ponay-n] phyenci-lul] ilk-ess-ta (GC Type)
teacher-TOP two CL-GEN student-NOM send-MOD letter-ACC read
'The teacher read the letter that two students sent.'
B″: sensayngnim-un [[**haksayng-tul twu myeng-i** ponay-n] phyenci-lul] ilk-ess-ta (NI Type)
B‴: #sensayngnim-un [[**haksayng-tul-i twu myeng-i** ponay-n] phyenci-lul] ilk-ess-ta (FQ Type)

To the question A here, the FQ in the embedded structure is rather infelicitous, implying that the FQ cannot contribute to the focus projection. As noted by Han (2000), this also indirectly implies that the FQ prefers to function as a focus in the matrix clause.[22]

The canonical interpretation of the host NP also indicates that the FQ prefers to represent new information. The host NP of the FQ can be classified into two types: definite or bare NP interpreted as generic. When the host NP is definite, a partitive reading is induced as the default reading (see Downing, 1993 for Japanese):

(43) ecey po-n ku haksayng-tul-ul **sey myeng** hon-nayss-e
yesterday see-MOD the student-PL-ACC three CL scolded
'I scolded three of the students that I saw yesterday.'

[22] A full-fledged discussion of focus projection is beyond the scope of this paper, but focus projection is essentially a semantic/pragmatic phenomenon signaled with pitch accents. This implies that the projection may not be sensitive to syntactic constraints such as islands. As noted by Han (2000) and Büring (2006), the most natural focus projection would observe island constraints, but it is also possible to violate island constraints, depending on context.

When the host NP is a bare noun as in (44), partitive reading is less preferred though possible in a given context. Instead, the bare noun represents a 'type' and the FQ tells us the number of its instantiations:

(44) kongchayk-ul **twu kwen** sa-ss-ta
notebook-ACC two CL bought
'I bought two notebooks.'

This sentence does not mean that I bought two of the specific notebooks. It just means that I bought two unspecific notebooks. The data thus indicate that while the host of the given FQ is canonically given or old, the FQ provides new information. In what follows, we will see that any expression intervening between the FQ and its host NP is preferred to be given information. In particular, we will see that the distribution of FQs is also controlled by information structure and the properties of intervening expressions, in addition to the grammatical function of the host NP and types of the main predicate.

3.2. Puzzling contrasts and constraints on the thematic structure

The focus property of the FQ can account for its basic uses in various contexts, but there are still several puzzles that we need to consider.

• **Puzzle 1:** Just like the focus marking *wh*-expression, the FQ also induces an intervention effect. As illustrated in (45), the *wh*-expression cannot intervene between the NPI *Mimi-pakkey* and the licensor *anh-ass-ni* 'not-PAST-QUE':

(45) a. **Mimi-pakkey* **mwues-ul** mek-ci *anh-ass-ni*?
Mimi-only what-ACC eat-CONN not-PAST-DECL
'(Int.) What did only Mimi eat?
b. **mwues-ul** *Mimi-pakkey* mek-ci *anh-ass-ni*?

Interestingly, the FQ can also behave like a wh-expression. The FQ itself can be an NPI with the marker *pakkey*, but as in (46b) when the object is used as an NPI, the FQ cannot intervene between the NPI and its licensor:

(46) a. haksayngtul-i ku chayk-ul *sey myeng-pakkey* ilk-ci *anh-ass-ta*
student-NOM the book-ACC three CL-only read-CONN not-PAST-DECL
'Only three students read the book.'
b. *haksayngtul-i *ku chayk-pakkey* **sey myeng** ilk-ci *anh-ass-ta*
students-NOM the book-only three CL read-CONN not-PAST-DECL
c. (?)haksayngtul-i **sey myeng** *ku chayk-pakkey* ilk-ci *anh-ass-ta*
students-NOM three CL the book-only read-CONN not-PAST-DECL
'Students read only the book.'

This contrast on one hand shows that the FQ functions as a focus marker. But on the other hand, it tells us the need to explain why examples like (46a) and (46c) are felicitous.

• **Puzzle 2:** Unlike a locative or high adverb, a low manner adverb may not precede an FQ (see Ko, 2007):

(47) a. haksyang-tul-i swuep.cwung-ey **sey myeng** pwunmyenghi wusessta
student-PL-NOM class.while-at three CL evidently laughed
'Three students evidently laughed during class.'
b. ??/*ai-tul-i khu-key **sey myeng** wusessta
child-PL-NOM loudly three CL laughed
'Three children laughed loudly.'

However, note that when the manner adverb follows an FQ, the grammaticality improves a lot:

(48) ai-tul-i **sey myeng-i** khu-key wusessta
child-PL-NOM three CL-NOM loudly laughed
'Three children laughed loudly.'

Within the stranding view, this contrast can be followed, given the assumption that the locative adverb is a higher adverb while the manner is a lower adverb (see Ko, 2007). That is, a low adverb like *ilpwule* 'deliberately' may not intervene

between the subject and its FAQ, in contrast to the high adverb *pwunmyenghi* 'evidently' (data judgements from Ko, 2007, see Miyagawa and Arikawa, 2007 for a similar argument):

(49) a. ?/*haksayng-tul-i [ilpwule [**sey myeng** kong-ul patassta]]
student-PL-NOM deliberately three CL ball-ACC received
'Three students received a ball deliberately.'

b. haksayngtul-i [pwunmyenghi [**sey myeng** kong-ul patassta]]
student-PL-NOM evidently three CL ball-ACC received
'Three students evidently received the ball.'

Given that the subject undergoes A′-movement to a position higher than the initial Spec of TP, the subject in (49b) moves to a higher position (Spec of TP) across the high adverb. This configuration would still have both in the same mutual c-command positions. Meanwhile, with the low adverb intervening as in (49a), the two are then in non-local positions: one in the higher and the other within the VP. This would then violate the strict locality requirement. This seems to be quite appealing, but once again, as we will see in what follows, this contrast can vanish in many contexts, implying that there are additional factors in licensing the adverbs with an FQ.

• **Puzzle 3:** As noted earlier, the subject/object asymmetry can disappear when the FQ is case or delimiter marked. The asymmetry between subject and object can easily disappear when the object is definite (or generic) and the NUM-CL is case-marked or bears a delimiter. Even both direct and indirect object can intervene, which violates the supposed locality condition (see Ko, 2007 for Korean and Miyagawa and Arikawa, 2007 for Japanese):

(50) a. **haksayng-tul-i** ku kes-ul **sey myeng**-i/man/kkaci ilkessta
student-PL-NOM the thing-ACC three CL-NOM/only/even read
'(Int.) (Even/Only) Three students read the thing.'

b. ?**ai-tul-i** phyenci-lul sensayngnim-eykey **yel myeng-ina** ponayssta
children-PL-NOM letter teacher-DAT ten CL-even sent
'Even ten children sent letters to the teacher.'

As we have seen repeatedly, in addition to the type of main predicate verbs (transitive, unergative, and unaccusative), the information structure as well as the properties of intervening elements can also influence the license of the FQ in a remote position.

• **Puzzle 4:** The unergative and unaccusative asymmetry can also disappear with a proper context. Canonically unergative structures disfavor FQ as repeated here:

(51) ??/*haksayng-tul-i caki-uy ton-ulo **twu myeng** chenhwahayessta
student-PL-NOM self-GEN money-with two CL phoned
'Two students made a phone call with their own money.'

However, note that this can also be remedied by context with a minimum change:

(52) (?)haksayng-tul-i caki ton-ulo cikcep Seoul-ey **twu myeng** cenhwahayessta
student-PL-NOM self money-with without.help Seoul-at two CL phoned
'Two students made a phone call to Seoul with their own money without any help.'

As noted here, the grammaticality of (51) improves greatly when the intervening expression includes a more clear scene-setting expression like *cikcep*. Of the 10 native speakers we consulted, none takes (52) as unacceptable, though there is a difference in the degree of acceptability from perfect to less natural.

The 10 native speakers we have consulted show different judgements on these puzzling data, but all agree that a high pitch on the FQ or a long pause just before the FQ also improves the grammaticality to a significant level. The natural question that follows is thus why we have such variations in the data judgements among speakers. One direction we can take is to distinguish typical standard examples from nonstandard-judgement cases as suggested by Miyagawa and Arikawa (2007) for Japanese or adopt a hybrid analysis elaborated by Kang (2002), Fitzpatrick (2006), Ko (2005, 2007), among others. Just like the analysis we sketch here, these previous analyses also place emphasis on the role of the relationship between focus and pause (or a delimiter-marked FQ) in licensing the FQ construction. However, we depart from these in an attempt to provide a uniform analysis for both standard and non-standard cases.

In this paper, adopting the insights of the previous hybrid analyses and looking at the puzzles from a functional point of view, we claim that these puzzles are closely related to the thematic structure in question. That is, we suggest that the floated NUM-CL and the modified verbal predicate serve as rheme in the thematic structure. According to Halliday and Matthiessen (2004) and Matthiessen and Halliday (2009), theme is the starting point of the message chosen by the speaker/writer while rheme is the remaining part that develops the theme, a participant, circumstance or process. That is, the theme is to be thought of as that part of an utterance which connects it to the rest of the discourse while the rheme is that part of an utterance that advances the discussion by contributing novel information. Consider the following pair:

(53) a. [College life] should be varied and colorful.
b. [Well but then, wouldn't the best idea] be to join the group?

The unmarked theme is in general the subject *college life* as in (53a), but there can be more then one theme (textual theme *well*, interpersonal theme *but then*, and experiential theme *wouldn't the best idea*) as in (53b). The theme in a clause thus extends from the beginning of the clause up to the first element that is either a participant, circumstance or process.

As also observed by Steedman (2000), the theme and rheme partitioning determines the overall intonation pattern. As an illustration, consider the following pair:

(54) Q: I know who proved soundness. But who proved COMPLETENESS?
A: (MARCEL) (proved COMPLETENESS)
H* L L+H* LH%

(55) Q: I know which result Marcel PREDICTED. But which result did Marcel PROVE?
A: (Marcel PROVED) (COMPLETENESS)
L+H*LH% H* LL%

Here, the symbols 'H' and 'L' represent 'high' and 'low' tone, and '*' denotes that the tone is aligned with a stressed syllable and % means an utterance boundary. In (54), there is a prosodic phrase on the subject MARCEL, at the end of which marks a rapid fall to low pitch. There is another prosodic phrase on 'COMPLETENESS' with a rising pitch accent (LH). The situation is different in (55): the order of the two tunes is reversed. The high pitch is on the word 'PROVED' whereas 'COMPLETENESS' has a low pitch tune. As different tunes on these two would yield incoherence, Steedman (2000) claims that the tunes L+H* LH% and H*L are respectively associated with the 'theme' and 'rheme'.[23]

The observations here indicate that intonation structure also plays an important role in signaling the partition of thematic structure, theme and rheme. Korean is not an exception: the information as well as intonation structure is closely linked to the partition of theme and rheme.[24] We also suggest that the floated NUM-CL, denoting new information on the quantity of the host NP, sets apart theme and rheme whose constraint can be paraphrased as in (56)[25]:

(56) Thematic Constraint for the FQ in Korean:
A floated NUM-CL in Korean introduces new information and, as a default, sets off rheme in the thematic structure.

The constraint implies that the FQ functions as a focus marker and at the same time signals the partitioning of the thematic structure of the given sentence into theme and rheme. This thematic constraint can tell us why certain examples are more natural than others, leading to variations in the judgement of sentences with an FQ.[26]

[23] As noted here, these two terms are roughly corresponding to the traditional distinction between topic and comment. See Steedman (2000) for further discussion.

[24] In fact, we also performed a simple experiment to check the partition of information structure cued by the intonation in the language. As noted in Jun (2005), and Jun et al. (2006), and others, Korean is not a pitch-accent language like English but an edge-prominence language in which a prominent word is located at the beginning of a phrase. That is, a prominent word is located at the beginning of an accentual phrase. To see how native speakers utter the NI and FQ involved sentences, we performed an acoustic analysis in Praat. In particular, we have checked the FQ associated with the subject as well as the object. To minimize the possible linguistic bias, we have asked 5 non-linguists (2 male and 3 female, 22–25 years old) to read 15 examples starting with two introductory sentences followed by one FQ involved sentence. The test results show us that the pitch tone is reset (LH) at the FQ, indicating the start of an accentual phrase. This pilot experiment, though requiring more fine-grained designs, hints that the FQ plays a role in resetting the pitch intonation and signalling the starting point of the rheme by the FQ.

[25] We believe that this constraint may hold for typologically similar languages likes Japanese too even though differences remain in morphosyntactic properties such as the case marking on the FQ and constituenthood.

[26] As a reviewer points out, the term 'default' may weaken the feasibility of the Thematic Constraint in (56). For the discussion of non-default cases, see the end of this section.

As for the predictions the Thematic Constraint in (56) can make, let us first consider the assumed subject/object asymmetry and related examples once again[27]:

(57) a. (?/??)haksayng-tul-i chayk-ul **sey myeng** ilkessta
student-PL-NOM book-ACC three CL read
'(int) Three students read books.'
b. haksayng-tul-i Chomsky-uy chayk-ul || **sey myeng** ilkessta
student-PL-NOM Chomsky-GEN book-ACC three CL read
c. haksayng-tul-i chayk-ul || **sey myeng-man** ilkessta
student-PL-NOM book-ACC three CL-only read

Examples like (57a), where the object intervenes between the subject and its NUM-CL, are considered unnatural as noted earlier or even unacceptable, but the acceptablity of such examples can be improved by several factors such as a long pause after the FQ, a delimiter focus marker on the FQ as in (57b) or the definiteness of the object as in (57c).[28] This difference is expected in the present functional account. When the bare object *chayk-ul* 'book' represents new information as indefinite, the FQ then cannot start off the rheme (marked with the symbol ||), rendering the sentence rather weird or unacceptable. However, when the object NP is interpreted as generic or definite in the given context so that it serves as given information, the FQ can be focus and becomes more informative.[29]

The point here is that when the object represents given information, this sentence becomes much better and can be acceptable. This means that when the FQ becomes more clear in representing focus (e.g., having a delimiter marker or all the preceding expressions represent clear topic), the grammaticality will improve (a similar point is also noted by Kuno and Takami, 2003 for Japanese). Consider the following examples adopted from Japanese examples cited by Kuno and Takami (2003):

(58) a. chotunghaksayng-tul-i ku chayk-ul sey myeng-ina ilkessta
elementary.students-PL-NOM the book-ACC three CL-even read
'Even three elementary school students read the book.'
b. (?/??)chotunghaksayng-tul-i chayk-ul sey myeng-ina ilkessta

The difference between the two examples here is that the sentence (58a) is more natural than the one in (58b): the only difference is that the object in the former is definite. What this implies in the present context is that with the object being given information, the focus FQ then can naturally function as the starting point of the rheme. The definiteness of an intervening object as well as the delimiter or case (focus) marker can thus contribute to improving the acceptability of FQ sentences since this would make the FQ more 'informative' than the intervening NP.[30]

[27] To some speakers examples like (57b) where the FQ is not case-marked are worse than those with the case or delimiter-marked FQ. To such speakers, more contextual or prosodic clues are needed to accept this kind of caseless FQ example. The caseless FQ thus receives gradient linguistic judgements. The importance of gradient data for linguistic theory has been recognized, but systematic empirical studies of gradience are largely absent (see Aarts, 2007). This paper does not address this gradience issue either, but we believe that the starting point is to license 'non-standard' examples like (57b) and then seek an account for the gradience. For the discussion of licensing such non-standard examples in the grammar, see Miyagawa and Arikawa (2007) and Saito et al. (2008) for Japanese and Kang (2002) and Ko (2009) for Korean.

[28] A similar point is also made by Kang (2002) for Korean and Kuno and Takami (2003) for Japanese.

[29] Though it is beyond the scope of this paper, we can roughly define 'informativeness' in terms of the Givenness Hierarchy suggested by Gundel et al. (1993):

(i) Givenness Hierarchy
a. in focus > activated > familiar > uniquely identifiable > referential type > type identifiable
b. it > this/that/this N > that N > the N > indefinite > this N > a N

As shown in the examples in (b) corresponding to the hierarchy, the indefinite NP represents less given or more new information than the definite NP. In a similar vein, following Chafe (1976), 'newness' can be defined as referring to the extent to which the speech signal alters the listener's conscious knowledge. The indefinite NP canonically 'adds' new information while two pieces of contrasting information will also evoke new information in discourse. However, a generic or definite NP canonically does not evoke new information unless it is used as contrastive or replacing information as in self-correction examples like *The cat, I mean, the dog fell into the hole*. In the paper, we follow this general notion in using the term 'informativeness' or 'newness'.

[30] Our functional view is similar to Kuno and Takami (2003) for Japanese that attributes the uses of the FQ to a functional constraint: the most important (or new) information needs to appear in an immediate preverbal position.

Note that when the intervening object is an indefinite, the acceptability decreases a lot:

(59) *haksayng-tul-i || etten chayk-ul **sey** **myeng** ilkessta
student-PL-NOM || some book-ACC three CL read
'(int) Three students read books.'

The present analysis can attribute this degraded acceptability to the constraint in (56): it is not the FQ but the indefinite object NP that signals the starting point of rheme.

Note that when the FQ is associated with the object as in (60), nothing is wrong in terms of the functional constraint:

(60) a. haksayng-tul-i chayk-ul || **sey** **kwen** ilkessta
student-PL-NOM book-ACC three CL read
'(int) Students read three books.'
b. chayk-ul haksayng-tul-i || **sey** **kwen** ilkessta
book-ACC student-PL-NOM three CL read
'As for this book, students read three.'

As we have seen, in (60a), the host bare NP is interpreted as generic while the FQ represents 'type' instantiations. It is hard to interpret the object here as an indefinite NP. This in turn means, the FQ represents focus information, starting the rheme of the sentence. Meanwhile, in (60b), the object is scrambled to the sentence initial position, canonically functioning as a topic. Note that the nominative subject does not denote unspecific students, but refers to the students already invoked in the context. Thus, in this example too, the focus FQ is the most informative, starting off rheme in the thematic structure.

Now let's consider the intervention effect within the present analysis. The generalization we need to evoke is that a focalized element cannot intervene between the FQ and its host, presumably because the FQ is also a focus:

(61) a. ??/*haksayngtul-i || sakwa-pakkey sey myeng mek-ci anhassta
students-NOM apple-only three CL eat-CONN not
'Three students ate only apples.'
b. haksayngtul-i || sey myeng-pakkey sakwa-lul mek-ci anhassta

(61a) is rather infelicitous since the NPI expression *sakwa-pakkey* starts off the rheme. When the FQ is an NPI and starts off the rheme, we have a felicitous example as in (61b). We can observe a similar contrast in the following with a locative phrase functioning as a focus:

(62) a. ??/*haksayngtul-i || kyosil-eyse-kkaci sey myeng nolassta
students-NOM classroom-at-even three CL played
'Three students even played at the classroom.'
b. haksayngtul-i || sey myeng-kkaci kyosil-eyse nolassta
student-NOM three CL-even classroom-at played

Such an intervention effect is hard to capture if we do not rely on the Thematic Constraint we propose here.[31]

The present analysis can also account for the difference between high and low adverb with respect to the distribution of a floated NUM-CL whose data we have seen in (47) and repeat here:

(63) a. ai-tul-i ecey sey myeng kyosil-eyse pwunmyenghi wusessta
child-PL-NOM yesterday three CL classroom-at evidently laughed
'Three children evidently laughed during class yesterday.'

[31] As a reviewer notes, examples like the following seem to sound better:

(i) ?sensayngnim-un pwuca-i-n John-eykey-kkaci kongchayk-ul twu kwen cwuessta
teacher-TOP rich-COP-MOD John-DAT-even notebook-ACC two CL gave
'The teacher gave two notebooks even to the richer John.'

Note that there is no intervening element between the FQ and its associate, unlike those in (61a) and (62a). This then gives us the possibility of starting off the rheme from the FQ or the delimited NP *John*.

b. *ai-tul-i khu-key sey myeng wusessta
child-PL-NOM loudly three CL laughed
'Three children laughed loudly at the classroom.'

Within the traditional stranding view, the contrast may follow from the following derivations:

(64) a. [$_{TP}$ ai-tul-i$_i$ [$_{VP}$ ecey [$_{VP}$ [t$_i$ sey myeng] kyosil-eyse pwunmyenghi wusessta]]]
b. *[$_{TP}$ ai-tul-i$_i$ [$_{VP}$ t$_i$ [$_{VP}$ [khu-key sey myeng wusessta]]]]

In (64a) with the high adverb *ecey* 'yesterday' the NUM-CL is in the same local domain with its associated subject here, observing the strict locality requirement. However, in (64b) with the low adverb *khu-key* 'loudly', the subject and its NUM-CL are not in the same local domain.

The present functional analysis need not resort to movement operations. Note that unlike locative adverbs, manner adverbs cannot be topicalized (see Kuno and Takami, 2003 for Japanese)[32]:

(65) a. kyosil-eyse-nun ai-tul-i wusessta
classroom-at-TOP children-NOM laughed
'As for the inside of the classroom, children laughed.'
b. *khu-key-nun ai-tul-i wusessta
loudly-TOP children-NOM laughed

This difference, as argued by Kuno and Takami (2003), supports the view that manner adverbs are preferred to be used as focus. Given this assumption, the manner adverb cannot precede the focused FQ since this ordering would then violate the Thematic Constraint:

(66) a. haksayngtul-i || sey myeng khu-key wusessta
student-NOM three CL loudly laughed
'Three students laughed loudly.'
b. *haksayngtul-i || khu-key sey myeng wusessta
student-NOM loudly three CL laughed

When the FQ precedes the manner adverb, there is nothing wrong in terms of the Thematic Constraint in (56). However, when the manner adverb precedes the FQ as in (66b), the FQ then cannot start off the rheme.

An advantage of this functional account over stranding or configurational approaches can be found from the fact that the manner adverb may precede an FQ when the FQ is further marked with a focus marker:

(67) a. (?)ai-tul-i khu-key || sey myeng-ina wusessta
child-PL-NOM loudly three CL-NOM-even laughed
'Even three children laughed loudly.'
b. (?)haksayng-tul-i caseup sikan cwung amwuto molukey salmyesi || sey myeng-ina tomangkassta
student-PL-NOM self.study hour while anybody not.knowing quietly three CL-even ran.away
'Even three students ran away during the self-study hours without being noticed.

The focus marker on the FQ, making it more informative than the manner adverb, may signal the starting point of the rheme. Note that if the FQ is without the focus marker, this sentence is degraded.When the intervening expression between the host NP and its FQ provides enough scene-setting information, we can observe that the manner adverb can precede the FQ as in (67b). The improvement in the acceptability of all these examples, which otherwise will be simply unlicensed, is rather unexpected if we rely only on syntactic views. The native speakers we consulted with also confirmed the significant improvement in the grammaticality for examples like (67), compared with those like (66b).

Our functional account can also get support from the claimed contrast between unergative and unaccusative. As noted earlier, the unaccusative is natural with an FQ while the unergative subject disfavors it (see Ko, 2007):

[32] With a contrastive topic meaning on the topicalized adverb, (65b) may be acceptable. It seems that most of the adverbial elements, even including the FQ, can be topicalized with a contrast meaning.

(68) a. koyangi-ka pyeng-ulo sey mali cwukessta
cat-NOM illness-of three CL died
'Three cats died of illness.'
b. ?*haksayng-tul-i caki ton-ulo twu myeng cenhwahayessta
student-PL-NOM self money-with two CL phoned
'Two students made a phone call with their own money.'

In the stranding view, (68b) with the unergative verb 'phoned' violates the strict locality condition between the subject and its NUM-CL. However, note that the grammaticality of (68b) improves greatly with supporting elements:

(69) (?)haksayng-tul-i caki ton-ulo cikcep Seoul-ey || twu myeng cenhwahayessta
student-PL-NOM self money-with without.help Seoul-at || two CL phoned
'Two students made a phone call to Seoul with their own money without any help.'

In the context where it is important to see how many students made a phone call to Seoul by themselves, such a sentence is more than acceptable, supporting our analysis.

The thematic constraint in (56) is stated to apply as default, implying that there are non-default cases, and in fact, there are cases where the FQ does not start off the rheme because of grammatical factors such as discourse prominence relations. Consider the following utterance:

(70) A: haksayng-tul-i way celay?
student-PL-NOM why so
'Why do students behave like that?'
B: ung haksayng-tul-i cikum demohalyeko hay.
yea student-PL-NOM now demonstrate-to. do
'Yea, students are trying to do a demonstration.'

In this context, the whole sentence represents focus information. As such, the FQ can be within a presentational focus:

(71) A: What happened?
B: || haksayng-tul-i sey myeng-i o-ass-e
student-PL-NOM three CL came
'Three students came.'

In this example, the FQ is be used in an event-reporting sentence where the entire sentence is focused. We may have contexts where the expression preceding the FQ in the given VP can start the rheme, but note that this in general is less unacceptable[33]:

(72) A: What is Mimi doing?
B: Mimi-nun [haksayng-tul-lul manna-ko isse]
Mimi-TOP students-PL-ACC meet-CONN exist
'Mimi is meeting students.'
B′: #Mimi-nun [haksayng-tul-ul yel myeng manna-ko isse]
Mimi-TOP students-ACC ten CL drink-CONN exist
'Mimi is meeting 10 students.'

As an answer to the VP question of what Mimi is doing, the one with no FQ as in B can serve as a felicitous one. However, the one with the FQ as in B′ sounds rather unnatural, supporting our suggestion that the FQ, as default, starts off the rheme in the thematic structure. Of course, B′ can be improved if the FQ is marked with a focus marker:

(73) B″: Mimi-nun haksayng-tul-ul **yel myeng-ina** manna-ko isse
Mimi-TOP student-PL-ACC ten CL-even drink-CONN exist
'Mimi is meeting even 10 students.'

[33] As a reviewer points out, when the FQ denotes one particular entity (e.g., *hana* 'one'), the acceptability improves. This may be due to the fact that the FQ then can get narrow focus. As for the focus projection of delimiters, see Büring (2006) for details.

This reply sounds much better than B′ simply because the FQ with the focus marker can start off the rheme structure. However, note that this response places strong discourse prominence on Mimi's meeting of not one but ten students, which may be quite an unusual situation. Seeing this, we can see that the FQ need not start off the rheme when it is within a lager focus domain, in particular when the more discourse prominent includes the FQ.

There can be another case where the default rule can be overridden, as we have noted earlier. Consider the following examples from Kang (2002):

(74) a. *sey pyeng-ul haksayng-i photocwu-lul masiessta
three CL-ACC student-NOM wine-ACC drank
'Students drank (surprisingly) as many as three bottles of wine.'

b. ??sey pyeng, haksayng-i photocwu-lul masiessta
three CL, student-NOM wine-ACC drank
'Students drank (surprisingly) as many as three bottles of wine.'

c. sey pyeng-ina haksayng-i photocwu-lul masiessta
three CL-even student-NOM wine-ACC drank
'Students drank (surprisingly) as many as three bottles of wine.'

The examples here illustrate that the FQ can precede its associated NP when it is marked with a delimiter whose main function is to add a discourse function. In typical cases, the language (similar to Chinese but unlike Japanese) does not license the bare FQ to precede its associate NP as in (74b) (see Saito et al., 2008). However, the delimiter-marked FQ in (74c) seems to sound much better, indicating that the delimiter marked FQ with a special discourse function has much less distributional constraints. Note that not all positions assign discourse prominence to the FQ[34]:

(75) */??haksayng-i sey pyeng-ina mollay photocwu-lul masiessta
student-NOM three CL-even secretely wine-ACC drank
'Students secretely drank (surprisingly) as many as three bottles of wine.'

The contrast between (74c) and (75) indicates that the delimiter marked FQ can precede its host NP when it is topicalized. Considering that the language allows an adverbial to be topicalized, this possibility is not unexpected within the VP-modifier treatment.

We cannot do justice here to all non-default cases, but have seen two non-default cases: one is where the FQ is included in the wider focus expression and the other is where the FQ is in the sentence initial position with a contrastive topic information, as also hinted by Kang (2002). Both cases override the default condition because of the placement of discourse prominence in a different grammatical position. We can conclude that the non-default case is not arbitrary but controlled by grammatical conditions like discourse prominence.

4. Conclusion

Korean numeral classifiers display flexible distributional possibilities including the FQ type. There have been two competing views: stranding and VP-modifier. The rationale for stranding approaches comes from the close syntactic and semantic relationship between the GC/NI type and the FQ type (see Fitzpatrick, 2006 for a summary), subject-object asymmetries, and the unaccusative/unergative contrast for languages like Japanese. We have noticed that the same rationale cannot be applied to Korean which employs a more visible case or delimiter marker on the FQ. There are simply too many examples that do not show the contrasts claimed to support the stranding view. The VP-modifier view implies more flexible distributional possibilities, but it also has issues to be addressed. For example, the VP-modifier view needs to account for the differences of the FQ from canonical adverbs and is required to offer a way of linking the FQ with its associated NP. In this paper, we have seen that through reference to grammatical functions such as SUBJ and COMPS, we can have a surface-oriented analysis.

[34] As a reviewer suggests, examples like the following seem to sound better even if the FQ in the non-topic position precedes the associate NP:

(i) na-nun [Mimi-ka sey pyeng-*(ina) mollay photocwu-lul masi-ko chwuthay-lul pwuli-n] nal-ul kiekhata.
I-TOP Mimi-NOM three CL-even secretely wine-ACC drink-CONJ disgraceful.conduct-ACC show-MOD day-ACC remember
'I remember the day Mimi secretly drank even three bottles of wine and showed some disgraceful behavior.'

Note that without the delimiter marker, this ordering seems to be weird, observing the general constraint that the FQ does not precede its associate NP unless it carries a specific discourse function, a contrastive focus in such examples.

Even though both the stranding and the VP-modifier views can have certain explanatory power, neither of the two is enough to account for why the FQ 'floats'. Following previous work, we have elaborated the focus function of the FQ. In particular, we have argued that the FQ basically conveys new information, setting off the rheme in the given clause as default. This view provides us with a straightforward account for the distribution of FQ in Korean in a wider context and implies wider variation in speaker judgements.

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