A CONSTRAINT-BASED LEXICAL APPROACH TO "FLOATING" QUANTIFIERS[1]

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In this paper, I present a new nonderivational analysis of the so-called "floating" quantifiers (FQs, hereafter) in English and Korean within the framework of Head-Driven Phrase Structure Grammar (HPSG).[2] I show that FQs do not move from place to place, arguing that English FQs are adverbs modifying verb phrases whereas Korean FQs are complement NPs.

I review a derivational approach to English FQs, classical and conventional, revealing some of their problems in Section 1. Then I proceed to propose my own constraint-based, lexical approach to English FQs in Section 2.1. In Section 2.2, I discuss some consequences of the lexical approach, especially involving certain different behaviors of FQs in *Tough*, Raising, and EQUI constructions. In Section 3, I treat Korean (and some Japanese) data, and attempt to improve upon [1] and the relevant part of [2] on some particular details, while supporting their basic theoretical merits. After some discussion of parametric differences between English and Korean, Section 4 concludes the paper.

1. The Derivational Approaches

In classical transformational grammar, FQs like *all, both* or *each* in (1-3) below are originated from subject NPs, and so (1), (2) and (3) are derived by a movement rule from (4a), (5a) and (6a) respectively. (See [3] (291-321) for an earlier formalization of this approach.)

(1) The boys all left the girls.
(2) The boys both left the girls.
(3) The boys each left the girls.
(4) a. All of the boys left the girls.
    b. All the boys left the girls.
(5) a. Both of the boys left the girls.
    b. Both the boys left the girls.
(6) a. Each of the boys left the girls.
    b. *Each the boys left the girls.

The movement rule should move the quantifier, which is the head noun of the subject NP, and place it at some place in the VP, and subsequently the preposition *of* should be erased. This kind of structure-destroying movement rule will not be theoretically permissible in any framework today including even the GB theory. Thus more recently, [4], among others, presented a GB account of the problem.

(7) D-Structure: [SPEC ____] [VP all (of) the boys left]
     S-Structure: The boys$_i$ [VP all t$_i$ left]

On this account, it is the subject NP, not the quantifier, that moves and the movement direction is leftward, in contrast to the rightward direction in the classical transformational account. The subject NP (*the boys* in (4a), for example) originates from

an NP consisting of the Q *all* and the subject NP *the boys* which is followed by the predicate verb. After the subject NP moves leftward to the SPEC (=subject) position, leaving the Q and its trace, the surface order 'Subject-FQ-VP' is obtained. Although this approach does not seem to destroy structures in the same way as the classical transformational approach does, it is still structure-destroying for a different reason. The problem is whether or not the preposition *of* is present in the D-structure. In the case of *all* or *both*, it will do either way: if it is assumed to be present, *of*-deletion would have to take place after the subject movement in order to obtain (1) and (4b) or (2) and (5b), and if it is not, (1) or (2) would be directly derived, whereas (4a) or (5a) would be obtained only after *of*-insertion applies. However, in the case of *each* in (3), the preposition would have to be present in the D-Structure; otherwise, sentences like (3) would have to be derived from unacceptable structures like (6b). In any way, there seems to be no way of preserving the structure "Q-of-NP".

[5] show that it is sometimes impossible to postulate a GB-style underlying structure because of a semantic anomaly, e.g. "all (of) none of the classes", which is also syntactically inadmissible:

(8) D-structure: *[SPEC___] [VP all (of) none of the classes have finished the exam] ==>
    a. *All (of) none of the classes have finished the exam.
    b. None of the classes have all finished the exam.

Secondly, the movement rule does not generally apply to quantifiers, but only to the three quantifiers *all*, *both*, and *each*. It does not apply to all the other quantifiers *some, many, much, few, a few, little, one, two* etc. as shown in (9) below. Whatever way the movement rule may be formulated to capture floating quantifiers, it would be a rule only for the three exceptional quantifiers. This suggests that the solution should be sought after elsewhere: in the lexicon. I will pursue this direction in the next section.

(9) a. Many/Some/Few/Three of the boys left her
    b. *The boys many/some/few/three left her.

2.1. A Lexical Approach to English FQs

Rejecting the derivational account, I argue for a nonderivational, constraint-based lexical approach to FQs on the basis of Head-Driven Phrase Structure Grammar ([6], [5]). My solution is in part a development of the old idea that FQs are adverbs modifying a VP, which has long been suggested both in the derivational ([7], [4] and [8], for example) and in the nonderivation framework ([1] and [5]). Theoretically, my account utilizes the proposal by [9] that English and French negative, *not* and *pas*, are two-faced: a VP modifying adverb from one perspective and a complement NP from another. I will show that English FQs are adverb adjuncts, whereas Korean FQs are complement NPs.

There are some similarities between frequency adverbs and FQs. First, FQs occupy the same positions in a VP as frequency adverbs:

(8) a. His wounds were *all* bleeding.
    b. His wounds were *often/sometimes/rarely* bleeding.
(9) a. We must appear to have *each* told a different story.
    b. We must appear to have *often/sometimes/rarely* told a different story.

Secondly, just as VP-Ellipsis cannot apply immediately after an adverb, it cannot apply immediately after a floating quantifier. This problem was originally discussed by [10].

(10) a. *Kim has never studied French, but Lee has *always*.

    b. Kim has never studied French, but Lee *always* has.

(11) a. *Most of them were Socialists, and perhaps they were *all*.

    b. Most of them were Socialists, and perhaps they *all* were.

Under the assumption that FQs are adverbs, the VP-Ellipsis phenomenon observed in (10) and (11) may be accounted for by one obvious generalization: An adverb must have a modifiee immediately following it. Both the adverb *always* and the FQ *all* in (10) and (11) are subject to this common generalization.
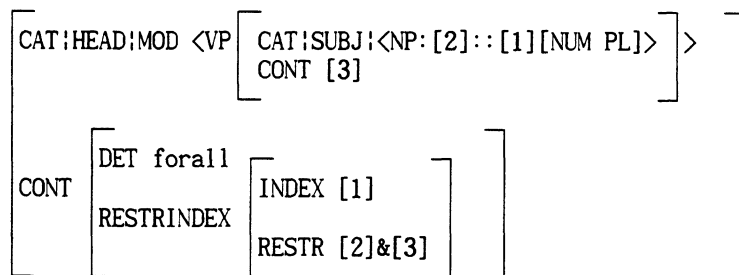
However, FQs are different from ordinary adverbs in many respects. FQs are subject to severe restrictions on their occurrence, which ordinary adverbs are not subject to. Most of all, the FQ of a sentence depends upon its subject:

(12) a. The boys all left girls.

    b. *The boy all left girls.

(13) a. The boys have each left her.

    b. *The boy has each left her.

(14) a. *The boy and the girl have all left.

    b. *The boy and the girl have each left.

    c. The boy and the girl have both left.

(15) a. John, Bill, and Tom have all left.

    b. *John, Bill, and Tom have each left.

    c. *John, Bill and Tom have both left.

All and *each* may not occur if the subject NP is singular. When the subject NP is a conjunction, *both* may, but *all* and *each* may not, occur if the conjunction is binary. And *all* may, but *each* and *both* may not, occur if the subject NP conjunction is ternary or more. Given the different constraints for different FQs, it is not possible to draw a generalization which would explain all the three FQs in the same way. Rather, it is more adequate to recognize the particular lexical property of each of the FQs and treat it separately on its own.

A simple way of accounting for such constraints of the FQs is to specify each of their lexical properties in the lexicon. For example, the FQ *all* is a VP modifier with two constraints: first, the subject NP of the modified VP is plural and secondly, it is a universal quantifier whose domain is restricted to the index of the subject NP. These syntactic and semantic constraints can be stated in the following attribute-value matrix:
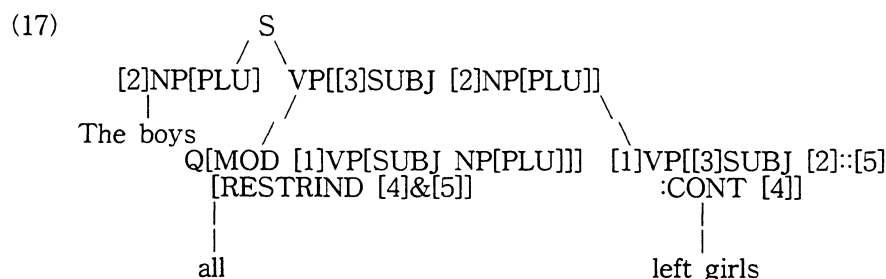
(16)

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⎡                                                                      ⎤
⎢ CAT¦HEAD¦MOD <VP ⎡ CAT¦SUBJ¦<NP:[2]::[1][NUM PL]> ⎤ >                ⎥
⎢                  ⎣ CONT [3]                       ⎦                  ⎥
⎢                                                                      ⎥
⎢        ⎡ DET forall  ⎡            ⎤ ⎤                                 ⎥
⎢ CONT   ⎢             ⎢ INDEX [1]  ⎥ ⎥                                 ⎥
⎢        ⎢ RESTRINDEX  ⎢            ⎥ ⎥                                 ⎥
⎢        ⎣             ⎣ RESTR [2]&[3] ⎦ ⎦                             ⎥
⎣                                                                      ⎦
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Abbreviation: MOD=MODIFIER, CONT=CONTENT, RESTR=RESTRICTION, RESRINDEX=RESTRICTED INDEX, RELN=RELATION, INST=INSTANCE, PL=PLURAL[3]
The tags after : and : : represent the CONTENT and INDEX value, respectively.

The propery of the FQ *both* and *each* will be specified in a similar way, paying attetion to the fact that *both* is limited to binary conjuncts and *each* cannot be used with any conjuncts.

Given this lexical information, the structure of grammatical sentence (12a) is roughly shown in (17) and all the relevant constraints are satisfied here:

(17)
```
                        S
                      /  \
        [2]NP[PLU]   VP[[3]SUBJ [2]NP[PLU]]
            |        /              \
     The boys      /                  \
             Q[MOD [1]VP[SUBJ NP[PLU]]]   [1]VP[[3]SUBJ [2]::[5]
                [RESTRIND [4]&[5]]              :CONT [4]]
                     |                             |
                     |                             |
                    all                         left girls
```

The ungrammatical (12b), for example, violates the plural requirement imposed on the MODIFIER attribute. The ellipsis sentence (11a) is ungrammatical simply because there is no VP for the FQ to modify, while (11b) is grammatical because there is such a VP after the FQ *all*. (Note that *were* is VP.)

Semantically, the information specified in the attributes CONTENT and INDEX in (16) guarantees the correct binding relation of the quantifiers shown in $(FORALL_x|\{boy(x)\})(EXIST_y|\{girl(y)\})left(x,y)$ and thus the universal quantifier *all* is is correctly associated with the subject NP, not with the object.

2.2. FQs in *Tough* and Raising or EQUI Constructions

An interesting consequence of the VP modifier analysis can be seen in the contrast shown between *Tough* and Raising or EQUI constructions, pointed out originally by [3] (316):

(18) a. The men are likely *all* to leave.
     b. Bill forced the men *all* to leave.
(19) *The men are stubborn *all* to talk to.

The FQ *all* may occur before the infinitive VP in a Raising or EQUI sentence like (18), but it may not in a *Tough* sentence as in (19). This contrast can be accounted for as a natural consequence of the combination of the lexical properties of *all* and the Raising or EQUI predicate on the one hand and the *Tough* adjective on the other. The FQ *all* requires, as its modfiee, an unsaturated VP whose SUBJECT value is a plural NP as is represented in (16). It is required that the unrealized subject of the infinitive complement be identical to the subject of the main verb in the Raising predicate *likely* and to the direct object of the main verb in the case of the EQUI predicate *forced* in (18). The two constraints are both satisfied in (18). In contrast, the *Tough* sentence (19) does not meet the requirement of *all* because there is no plural NP which could serve as the subject of the unsaturated infinitive VP *to talk to*. Note that the subject *The men* refers to the referent of the object NP of the preposition *to*. Such lexical characteristics of a *Tough* predicate like *stubborn* or of a Raising predicate like *likely* or an EQUI predicate like *force* are all specified as its lexical properties in HPSG . We may predict that if an expression is added to (19) which could serve as the subject of the infinitive VP, (19) will turn out grammatical. This prediction is borne out as shown in the following sentence in which the *for* phrase is the subject of the infinitive VP (Cf. [6] (124-128) for the treatment of the complementizer *for*).

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(20) The men are stubborn for the girls all to talk to.

Notice, in (20), that the *for* phrase supplies the plural NP which FQ *all* requires. Then the RESTRICTED INDEX of the FQ *all* is identical to the INDEX of the subject NP *the girls* of the unsaturated VP *to talk to*, and therefore all the constraints imposed on the FQ are met in (21). (See the feature structure (16).)

3. "Floating" Quantifiers and Numeral Classifiers in Korean

I argue that all Korean (and Japanese) numeral FQs are basically complement NPs, not adjuncts as in English, and that in addition to the basic type, there are a host of variations resulting from two pragmatic operations: omission and scrambling.

Besides FQs, there are "nonfloating" quantifiers occurring before nouns just as nonpredicative nominal adjectives do. These quantifiers do not occur anywhere else; in other words, they do not "float" as shown in (21a).

(21) a. *Motun* haksayng-i ttenassta.
    all   student-NOM left
    'All students left.'
    b. *Haksayng-i *motun* ttenassta.
    c. Haksayng-i *motuw(-ka)* ttenassta.[4]
                all

The "nonfloating" quantifier *motun* 'all' is distributed in the same way as ordinary nonpredicative adjectives, and its morphological structure is just like ordinary nonpredicative adjectives. The "floating" counterpart of *motun* is *motwu* appearing in (21c), but this is a noun, which may occur with or without nominal case marker, and we will focus on this type of quantifiers in this section, excluding constructions like (21a) from consideration because they are not FQs. (The type of sentences like (21c) will shortly be taken up in (23).)

[1] begins his discussion of FQs in Japanese citing the following type of sentences:

(22) a. *San-nin* gakusei-ga hon-o sensei-ni okutta.
    three-cl(person) student-NOM book-ACC teacher-DAT sent
    'Three students sent a book to a teacher.'
    b. Gakusei-ga *san-nin* hon-o sensei-ni okutta.
    c. *Gakusei hon-o *san-nin* sensei-ni okutta.
    d. *Gakusei hon-o sensei-ni *san-nin* okutta.

It seems to me that this starting point is somewhat misleading because a construction like (22a) is not a typical use of the numeral classifier *san-nin* 'three-classifier(person), the Korean counterpart of which is *sam-in*, *sam-myeng*, or *sey-myeng*. I think that *San-nin gakusei* 'three students' in (22a) is either a nominal compound or the result of omitting the particle *no* 'of' from *San-nin-no* 'three-persons-of'. In either way, there is a problem. Although it is acceptable as a nominal compound, (22a) cannot be associated with (22b) in such a way that the latter is a syntactic variation of the former. If we claimed that (22b) was a syntactic variation of (22a), we would be forced to admit that compounds may be disintegrated. This would argue against the well-known assumption that compounds are "islands" so that their internal parts may not be moved. (Cf. *Gakusei kaikan-ga ....* 'The student union is ...' vs. **Kaikan-ga gakusei....*) The possible alternative view of omission of particle *no* is also a problem. The particle *no* may be omitted in informal style, but only rarely in formal style, and since the classifier

construction with the particle is a formal style, the particle is not usually omitted. (We will come to this matter of omission shortly.)

In Korean, the omission of the *uy,* the Korean equivalent of *no,* leads to almost unacceptable utterances like (23a), whereas the Korean version of (22b), which is allegedly an FQ version of (23a), is perfectly acceptable:

(23) a. ?**Sey-myeng** haksayng-i chayk-ul sensayng-eykey   ponayssta.
        three-cl(person) student-NOM book-ACC teacher-DAT   sent
        'Three students sent a book to the teacher.'
   b. Haksayng-i **sey-myeng** chayk-ul sensayng-eykey ponayssta.

For this reason, I argue against Fukushima's view that there is a syntactic relation between (22a) and (22b) or between (23a) and (23b). Viewing that they are two different constructions, I propose that the numeral classifier with no case marker *sey-myeng* 'three persons' in (23b) or *san-nin* 'three persons' in the Japanese sentence (22b) is the omitted version of the numeral classifier with a case marker *sey-myeng-i* and *sin-nin-ga* respectively.

Consider the following further examples:

(24) a. Haksayng-i onul **motwu-ka** ttenassta.
       NOM   NOM
    'The students all left today.'
   b. Haksayng-i onul **sey-myeng-i** ttenassta.
     'The three students left.'
   c. Haksayng-i chayk-ul onul **twu-kwen-ul** sassta.
                ACC   two-classifier-ACC bought
    'The students bought two books today.'
   d. Haksayng-i onul chayk-ul **sey-myeng-i twu-kwen-ul** sassta.
     'The three students bought two books today.'

Notice that all the numeral classifiers occur with a case marker here unlike (23b) where the numeral classifier occurs with no case marker. To account for these cases, I argue that numeral classifiers are "converted" complements. By "complements" here, I mean subject NPs as well as direct and indirect object NPs. There is one more subject *motwu-ka* 'all-NOM' in (24a), and *sey-myeng-i* 'three persons-NOM' in (24b). In (24c) the transitive verb *sassta* 'bought' has an additional direct object *twu-kwen-ul* 'two-copy-ACC' beside the "original" direct object *chayk-ul* 'book-ACC' and furthermore in (24d) it has both an additional classifier subject and an additional classifier direct object, each specifying the number. I consider this kind of double nominative or accusative constructions as a realization of a lexical possibility of possessing additional complements by converting numeral classifiers into complements.[5] We can account for this conversion phenomenon by setting up a conversion lexical rule of the kind that [9] have utilized when they treat English *not* and French *pas* functioning as a complement. Given the SUBCAT list <NP[NOM], NP[ACC]> of a transitive verb, for example, the Classifier Complement Conversion Lexical Rule may give rise to another SUBCAT list <NP[NOM]$_i$, NP[ACC]$_j$, CLASSIFIER-NP[NOM]$_i$, CLASSIFIER-NP[ACC]$_j$> for the same verb. More generally, we can formulate the rule as follows:

(25) Numeral Classifier Complement Conversion Lexical Rule (NCCCLR)

$$
\begin{bmatrix}
\text{SUBJECT } \langle[1]\rangle \\
\text{COMPS } \langle[2],\ldots[3]\rangle \\
\text{SUBCAT } \langle[1]X_i, [2]Y_j, \ldots[3]Z_n\rangle
\end{bmatrix}
\Longrightarrow
\begin{bmatrix}
\text{SUBJECT } \langle[1], Q_i\rangle \\
\text{COMPS } \langle[2],\ldots,[3],(Q_j,(Q_n))\rangle \\
\text{SUBCAT}\langle[1]X_i, [2]Y_j, d\ldots, [3]Z_n, Q_i, (Q_j,(Q_n))\rangle
\end{bmatrix}
$$

In the lexical rule above, Q_i designates a numeral classifier or "floating" quantifier whose INDEX value is structure-shared (or coindexed) with the INDEX of the first argument specified as i [6] and $(Q_j,(Q_n))$ is intended to mean that if there are more than two complements, one or more quantifiers of them may optionally be converted into complements.

Applying (25) to (26), the unmarked subcategorization requirement of the intransitive *ttenata* 'leave' and the transitive *sata* 'buy', we obtain the converted SUBCAT list (27).

(26) a. ttena-ta 'leave': SUBCAT <NP[NOM]>
    b. sa-ta 'buy': SUBCAT <NP[NOM], NP[ACC]>
(27) a. ttena-ta: SUBCAT <NP[NOM]$_i$, Q_i>
    b. sa-ta: SUBCAT <NP[NOM]$_i$, NP[ACC]$_j$, Q_i, Q_j>

The sentences in (24) are all the realization of the converted SUBCAT lists (27a and b). The converted complements must have the same case markers as their "host" complements. This is guaranteed by the Lexical Rule (25): the first numeral classifier Q_i becomes the value of the SUBJECT attribute, and the second one becomes the first value of the COMPS value, and so on. Once numeral classifiers are placed in the appropriate positions in the SUBJECT and COMPS value list, they will be assigned correct case markers automatically.

Subsequently, one may omit case markers insofar as there is no danger of misunderstanding or confusion. Call such a pragmatic operation the Omission Tactics. Apply this, and we will have sentences shown below, and (23b) (and the Japanese sentence (22b) for that matter) are all accounted for in the same way.

(28) a. Haksayng-i onul *motwu* ttenasst.
    b. Haksayng-i onul *sey-myeng* ttenassta.
    c. Haksayng-i chayk-ul onul *twu-kwen* sassta.
    d. ?Haksayng-i chayk-ul onul *sey-myeng twu-kwen* sassta.
(29)=(22b) Haksayng-i *sey-myeng* chayk-ul sensayng-eykey ponayssta.
    'The three students sent a book to the teacher.'

We now have come to the point where we discuss the question of "scrambling". As is well known in the field of Korean and Japanese syntax, there has long been a controversy over the issue. I consider the issue of scrambling as a pragmatic matter, which is a similar position to my position concerning the omission phenomena that we discussed short while ago. One may scramble "almost" any complements for some pragmatic purposes, and certain scrambling is prohibited, but this for some pragmatic reasons, too. (See [2] for an extensive treatment of word order variation in Korean.) We call this pragmatic operation a Scrambling Tactics. Applying this, we obtain a further variety of sentences resulting from word order variation. Note that the Scrambling Tactics may apply to the sentences containing classifiers with or without case markers:

(30) a. Haksayng-i *motwu-ka* onul ttenassta. (by NCCCLR)
     b. Haksayng-i onul *motwu-ka* ttenassta. (by Scrambling)
     c. Haksayng-i *motwu* onul ttenassta. (by Omission)
     d. Haksayng-i onul *motwu* ttenassta. (by Omission and Scrambling)
     e.??*Motwu(-ka)* haksayng-i onul ttenassta.
(31) a. Haksayng-i *sey-myeng-i* onul ttenassta.
     b. Haksayng-i onul *sey-myeng-i* ttenassta.
     c. Haksayng-i *sey-myeng* onul ttenassta.
     d. Haksayng-i onul *sey-myeng* ttenassta.
     e.??*Sey-myeng(-i)* haksayng-i onul ttenassta.
(32) a. Haksayng-i chayk-ul *twu-kwen-ul* onul sassta.
     b. Haksayng-i chayk-ul onul *twu-kwen-ul* sassta.
     c. Haksayng-i chayk-ul *twu-kwen* onul sassta.
     d. Haksayng-i chayk-ul onul *twu-kwen* sassta.
     e. ??Haksayng-i *twu-kwen(-ul)* chayk-ul onul sassta.
(33) a. Haksayng-i chayk-ul *sey-myeng-i twu-kwen-ul* onul sassta.
     b. Haksayng-i *sey-myeng-i* chayk-ul *twu-kwen-ul* onul sassta.
     c. Haksayng-i chayk-ul *sey-myeng-i* onul *twu-kwen-ul* sassta.
     d. Haksayng-i chayk-ul onul *sey-myeng-i tuw-kwen-ul* sassta.
     e. Haksayng-i onul chayk-ul *sey-myeng-i twu-kwen-ul* sassta.
     f. Haksayng-i onul chayk-ul *sey-myeng twu-kwen* sassta.
     g. Haksayng-i onul *sey-myeng* chayk-ul *twu-kwen* sassta.
     h. Haksayng-i *sey-myeng* onul chayk-ul *twu-kwen* sassta.
     i. Haksayng-i onul chayk-ul *twu-kwen sey-myeng* sassta.
     j. Haksayng-i onul chayk-ul *twu-kwen sey-myeng-i* sassta.
     k. ?**sey-myeng* haksayng-i onul *twu-kwen* chayk-ul sassta.

Although some sentences are less acceptable than others, none of them can simply be characterized as ungrammatical; they all could be used under some suitable circumstances. It is worth noting that the least acceptable cases come about whenever numeral classifiers precede their coindexed complement NPs as in (30e), (31e), (32e), or (33k). Such oddness seems to be due to certain processing difficulty, of which I cannot discuss in detail here. So we can say that any kind of scrambled complement order is permissible unless classifier complements come before their coindexed complements. It is for this reason that I consider both word order variation and case marker omission to be a pragmatic matter, rather than a syntactic problem.
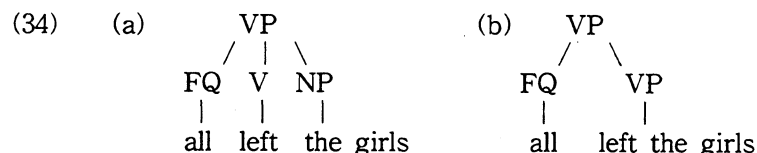
4. Conclusion

From what we have discussed so far, an important difference between English and Korean FQs is emerging: Korean FQs are converted complements, while English FQs are adjuncts modifying VPs. In Korean, various possible positions of FQs in a sentence are a consequence of the two pragmatic operations "omission" and "scrambling." In English, on the other hand, various possible positions of FQs are tantamount to various possible positions of VP-modifying adverbs.

Before concluding this paper, I examine an alternative view of FQs in both languages: Korean FQs are adjuncts and English FQs are complements. The former view was actually argued for in [1] and [2]. However, this view is questionable from a morphological point of view. Typical adverbs are characterized by particular adverbial suffixes like *-key, -hi, -i* as in *nuli-key* 'slowly', *chenchen-hi* 'slowly', *ppall-i* 'fast' etc. Numeral classifiers cannot be followed by such suffixes: **sey-myeng-hi*, **tuw-kwen-key*. Moreover, an adverbial phrase is composed of a noun followed by a

postposition: *yeki-ey* 'here-in (here)', *ku-ttay-ey* 'that-time-at (then)'. And numeral classifiers can also be followed by postpositions: *tuw-kos-ey* 'two-place(classifier)-at (at two places)', sey-kwen-ulo 'three-copy-into, or (into three books, as three books)'. This is good evidence showing that numeral classifiers are nouns, not adverbs. There are a few exceptions to this generalization, words that function as adverbs without having adverbial suffixes or postpositions: *nayil* 'tomorrow', *meyngil* 'tomorrow', *cikum* 'now'. Since these words are all Sino-Korean, they do not conform to the typical Korean morphology. Notice that Pure Korean time expressions like *ecey* 'yesterday' or *eckecekkey* 'the day before yesterday' may all be analyzable as nouns plus postpositions; *ecey=ec-ey, eckecekkey=ec-kecekk-ey*, where the final element is a postposition *ey* 'at'. Therefore, I maintain that these exceptions are only apparent and they do not affect the view that numeral classifiers, which have neither adverbial suffixes nor postpositions attached, are not adverbs. [7]

Next, consider the alternative view that English FQs are complements. I point out one problem in this view with regard to word order. In English, the complements of a verb are always preceded by their lexical head. Now, if FQs are complements, they would be the only kind of complements that are followed by their lexical head V as shown in the tree (34a):

(34) (a)   VP   (b)   VP
           / | \   /   \
        FQ   V   NP   FQ   VP
         | | | | |
        all left the girls   all   left the girls

On the complement view, FQs would be an exception to the generalization on the linear order of complements of a verb.
On our adverbial view of FQs, however, no such exception need to be recognized. The tree (34b) illustrates that FQ *all* which is the adverbial adjunct, is placed before the VP *left the girls.*, which the FQ modifies.[8] Thus in order not to give up the word order generalization, we abandon the complement view in favor of the adverbial view.

Using the HPSG framework, I have shown that FQs in English do not actually have to "float" anywhere, but occur before a VP and modify it like adverbs do. In Korean, FQs are complements of a verb, and these phenomena are dealt with by a Conversion Lexical Rule. In either language, any peculiar behavior of each of the FQs is to be specified as its lexical constraint, and it will interact with the lexical properties of other relevant words in the sentence. No movement rule needs to be stipulated. No grammatical processes need to be posited that move FQs from one "host" place to other places. This characterizes what we call a constraint-based lexical approach to FQs. This paper is an attempt to demonstrate that the constraint-based lexical approach is adequate enough even when it deals with "floating" quantifiers, which have been known to be one of the strongest evidence for the existence of a movement rule.

Notes

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2. I use the term "floating" not in its literal sense, but only to designate the phenomenon under discussion for the sole purpose of convenience.

3. I assume that the value PLURAL subsumes three or more conjuncts so that such conjuncts as in (15c) may be taken to be PLURAL, excluding binary conjuncts, in the sense of 'subsumption' used by [11] and [6].

4. The noun form *motuw* 'all' may occur in various positions in a sentence, but it will be shown shortly that this is an omitted variant of *motuw-ka* 'all-NOM or *motuw-lul*' all-ACC'.

5. Such converted complements are distinguished from "normal" complements. For example, numeral classifier complements are not passivized (*Twu-kwen-i haksayng-eykey chayk-ul phal-li-ess-ta* '*Two copies were sold the books by students.') and they cannot be relativized (*Haksayng-i chayk-ul sa-n twu-kwen...* 'The two copies which the students bought the books...'). These peculiarities are also seen in other double accusative constructions as in Suni-ka ai-lul son-ul cap-ass-ta. 'Suni caught the child by the hand.' vs. *Son-i Suni-eykey ai-lul cap-hi-ess-ta. *Suni-ka ai-lul cap-un son...* 'the hand that Suni caught the child...'. There seem to be certain semantic constraints involved in these constructions, but I have no specific explanation at the moment.

6. The notion "coindex" hereafter is understood as "structure-shared" in the sense of the term as used in HPSG. Thus to say that the index of the subject is identical with that of the floating quantifier does not mean that they refer to the same thing, which would be a nonsensical interpretation. It means that the index in the floating quantifer is restricted to the index of the subject so that it may decide the scope of the quantifier.

7. It seems to me that numeral classifiers appear to function like VP modifiers because of some similar constructions which do contain adverbs like *ta* 'totally, wholly, entirely' as in (i) below.

(i) Haksayng-i onul sey-myeng(-i) (*ta*) ttenassta.
     'The three students left (entirely or completely) today.'
     =All the three students left today."
(ii)=(24b) Haksayng-i onul sey-myeng ttenassta.
          'The three students left today.'

Interestingly enough, this adverb *ta,* while is semantically redundant, may always be omitted. After it is omitted as in (i), its meaning, i.e., the meaning of universal quantifier, still remains there: "The three students left" and "All the three students left" are logically equivalent. For this semantic reason, the numeral classifier in (i) looks as if it modified the verb *ttenassta* 'left', and yet this is only apparent. The modification relation is not due to any adverbial function of the numeral classifier, but due to the adverb *ta* 'entirely, completely' which has been omitted. Once the role of the Omission Tactics is recognized, it is not necessary to assume that classifiers act like adverbs.

8. One particular word order constraint needs to be stipulated which prevents FQs from occurring after VP (Cf. *The boys left the girls all*). This constraint applies to many frequency adverbs: *They have studied French always.*

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