Derivational Interpretation of Korean "wh-phrases"

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Ae-ryung Kim. 2002. Derivational Interpretation of Korean "wh-phrases". *Language and Information 6.2*, 153–169. In this paper I develop a mechanism of interpreting Korean "wh-phrases". The phrases have various readings depending on where they occur and they could be ambiguous even in the same structure. Yet their readings are subject to certain restrictions. I assume that the "wh-phrases" behave like variables and that there are three quantifiers to bind the phrases; $COMP_{wh}$, $COMP_{conc}$ and derivational ∃-quantifier. Based on the assumptions I suggest derivational quantification, which consists of three conditions. 1) A quantifier can bind only when it merges into the derivation; 2) ∃-quantifier accompanies [-OP] complementizer but its activation is optional; 3) an instance of quantification makes the clause opaque to other instances of quantification. Scrambling data support derivational approach and across-the-board interpretation motivates the opacity condition. The opacity condition accounts for ATB- interpretations of reflexive pronouns. It can also explain the island effect of wh-islands without adopting covert wh-movement in Korean. **(Kyungnam University)**

Key words: K-Ø, across-the-board reading, derivational quantification, opacity condition, optional activation

1. Introduction

It has been well known since Kuroda (1965) that the expressions for "wh-phrases" have other readings in Korean as well as Japanese and Chinese. Multiple readings of one of those expressions *nuku* are illustrated in (1).

(1) a. nuku 'someone'/ 'who'/ 'whoever'
b. nuku-(i)nka 'someone'
c. nuku-(i)na 'everyone'

Kuroda (1965) regards those expressions as denoting only basic semantic properties: *nuku* denotes 'human (=PERSON)', *mues* 'non-human object (=THING)',

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† This work is supported by the Kyungnam University Research Fund. This paper was presented at a monthly workshop of Korean Society for Language and Information. I appreciate the valuable comments of the participants. I would especially thank three anonymous reviewers for their comments, suggestions and corrections. All shortcomings belong to me.

ence 'time' etc. He labels those expressions as 'indeterminate pronouns'. C-M Suh (1989) names them as 'referentially undetermined words'. In the same line A-R Kim (2000) names them as 'K-nominals', 'K' standing for 'kernel'. A K-nominal constitutes a DP alone as in (1a), or with a non-Case particle as in (1b) and (1c). A-R Kim (2000) labels the former as K-Ø (pronounced as K-zero) and the latter as K-particle.

A K-Ø, for example, *nuku* in (1) can receive three readings depending on where it occurs as shown in (2).

(2) a. Nuku-Ø-ka wass-ta. 'Someone came.'
b. Nuku-Ø-ka wass-ni? 'Who came?'/ 'Did anyone come?'
c. Nuku-Ø-ka wo-tunci, hwanyongha-lketi-ta.
'Whoever may come, we will welcome him.'

A K-Ø is understood as an existential quantifier in a declarative clause and as a pseudo-universal quantifier in a concessive clause. In an interrogative clause, however, *nuku* can be understood either as an existential quantifier or as a wh-phrase. Considering that the question marker *-ni* marks both yes/no-questions and wh-questions, we can assume that a K-Ø is interpreted as a wh-phrase in wh-questions and as an existential quantifier in yes/no-questions. While the interpretation of a K-Ø is sensitive to its structural context, that of a K-particle is fixed. "K-*inka*" and "K-*ina*" are always interpreted existentially and universally, respectively.[1] This paper is only concerned with the interpretation of K-Øs.

I show that the pattern of K-Ø interpretations is much more complicated in a bi-clause than it is shown in (2) (section 2). I propose a mechanism to account for the interpretations of K-Øs (section 3). The system consists of derivational quantification and opacity condition. Quantification applies derivationally and an instance of quantification makes the domain opaque. The opacity condition is independently motivated to account for the interpretation of reflexive pronouns (section 4). The condition provides an account for why only wh-questions displays island effect in Korean.

2. Pattern of K-Ø Interpretations

A characteristic of K-Ø interpretation is across-the-board (henceforth ATB-) effect. When two K-Øs occur in an interrogative sentence, they should have the same interpretation as in (3).[2]

1. It is widely agreed that the quantificational force of K-particles comes from the particle. For detailed discussions of how the quantificational force is assigned, refer to Watanabe (1992), D-H Chung (1996), and A-R Kim (2000), among others.
2. S-W Kim (1989) judges (3c) as acceptable. As an anonymous reviewer points out, (3d) is also acceptable in forced contexts. Those readings, however, are different from regular wh-questions. A regular wh-question "who bought a computer?" has a presupposition that John bought something. The presupposition, however, can be canceled and "nobody" can be an answer to the question. "Nobody", however, is not a felicitous answer to the readings (3c) and (3d). It means that their presuppositions cannot be cancelled. Chang (1997), cited

(3) Nuku-ka mues-ul sass-ni?
   a. 'Did someone buy something?' c. *Who bought something?
   b. Who bought what? d. *What did someone buy?

The ATB-effect holds in a long-distance structure. Consider a structure where an interrogative sentence embeds a declarative clause as in (4).

(4) John-un [*nuku*-ka *mues*-ul sassta-**ko**] saengkakha-$\mathbf{ni}_{wh}$?
   a. Who does John think t bought what?
   b. *Who does John think t bought something?
   c. *What does John think someone bought t?

We saw that *-ni* marks yes/no-questions and wh-questions. If it is a yes/no-marker, a K-Ø is interpreted as an existential quantifier. I eliminated that interpretation from the readings of the sentence (4). I will ignore that interpretation to reduce cases of ambiguity, unless it is crucially relevant to the discussion. From now on *-ni* will be treated only as a wh-question marker in the discussion. Since a K-Ø is understood as a wh-phrase only with a wh-question marker, the reading (4a) tells that a K-Ø can be associated with a wh-question marker in a long-distance relation. The clause-mate two K-Øs should have an exclusive ATB-reading even in a long-distance relation.

A mixed reading is additionally allowed if two K-Øs appear in separate clauses in the same structure as in (5).

(5) *Nuku*-ka [Mary-ka *mues*-ul sassta-**ko**] saengkakha-$\mathbf{ni}_{wh}$?
   a. Who thinks Mary bought what?
   b. Who thinks Mary bought something?
   c. *What does someone think Mary bought?

In (5) *nuku* is generated in the matrix clause and *mues* in the embedded clause. Both can have wh-readings. A mixed reading is also acceptable, where *nuku* is interpreted as a wh-phrase and *mues* as an existential quantifier. The reversed reading is still not acceptable, though.

More interestingly, if we scramble one of K-Øs in (4) to the matrix clause as in (6), a mixed reading becomes acceptable.

(6) $Mues_i$-ul John-un [*nuku*-ka t_i sassta-**ko**] saengkakha-$\mathbf{ni}_{wh}$?
   a. Who does John think t bought what?
   b. *Who does John think t bought something?
   c. What does John think someone bought t?

The examples (4), (5) and (6) indicate that clause-mate K-Øs have ATB-readings exclusively. A mixed reading becomes additionally available if the K-Øs are placed in separate clauses either by generation or by scrambling.

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in Cheng & Rooryck (2000), argues that sentences like (3c) and (3d) are strongly presupposed and "seek details on an already established (or presupposed) situation."

3. Derivational Quantification

The analysis to be developed in this section starts on a less popular viewpoint about wh-questions in Korean. Chomsky (1977) treats a wh-question like (7a) as involving an operator-variable relation as shown in (7b) below.

(7) a. What did Mary buy?
b. For which x, x a thing, Mary bought x?
c. WHx [thing(x)] [Mary bought x]

In the representation a wh-phrase takes the role of the quantifier and its trace is treated as a variable. Higginbotham and May (1981) formalize the assumption into (7c). Departing from this standard approach, however, I assume that Korean wh-phrases (K-Ø in this paper) do not carry the role of wh-operator. Rather they serve as variables. The property of wh-operator is carried by wh-complementizer (henceforth COMP_{wh}). Before we move onto developing derivational quantification, I will briefly justify these two assumptions.

3.1 Quantifiers and Variables

The representation in (7c) is structured in three parts just like a quantified sentence: the operator (quantifier) 'WHx', the restriction 'thing(x)' and the nuclear scope 'Mary bought x'. I should make a clarification on the terminologies between 'operator' and 'quantifier'. The two can be alternatively used in most cases. The "operator" refers to connectives such as conjunction '$\wedge$', disjunction '$\vee$', conditional '$\rightarrow$', bi-conditional '$\leftrightarrow$', negation '$\sim$', universal '$\forall$', existential '$\exists$', among others.[3] The "quantifier" especially refers to two operators '$\forall$' and '$\exists$'. All the operators are applied to a proposition, but the two operators stand apart from the others in that they require an open proposition for their argument. In other words, their argument must involve a free variable. A-R Kim (2000) decomposes "quantifier" into quantificational force (henceforth QF) and a property of taking an open proposition, that is, of binding a variable. This property is represented as a feature [+OP] where "OP" pertains to an open proposition. The universal quantifier has feature [$\forall$] for its QF and [+OP], while the existential quantifier consists of [$\exists$] and [+OP]. Wh-operator is qualified for quantifier. It takes an open proposition for its argument and its QF is [+Q]. From now on I will call "WHx" in (7c) as wh-quantifier instead of wh-operator.

3.1.1 Variable in Korean Wh-questions. In the introduction we saw that a K-Ø is multiply interpreted. Based on the multiple readings of a K-Ø, Aoun and Li (1993) and A-R Kim (2000) regard K-Øs to behave like variables.[4] A-

3. In syntax the "operator" also refers to constituents which can move (or operate) such as auxiliary verbs, wh-words, etc.
4. The multiple readings of a K-Ø have been widely noted in the literature of Korean linguistics such as H-S Choe (1995), D-H Chung (1996), S-W Kim (1989), C-S Suh (1989), C-M Suh (1987), J-M Yoon (1999), among others.

R Kim (2000) gives a piece of supporting evidence. A K-Ø is ambiguous in an interrogative sentence as shown in (2b), repeated in (8).

(8) Nuku-Ø-ka wass-ni?
a. 'Who came?' b. 'Did anyone come?'

Suppose the lexicon has two items for a K-Ø, one with wh-reading and the other with existential reading. Then a question with two K-Øs should have four possible readings. This prediction, however, is not borne out as we saw from the exclusive ATB-reading in (3). The disallowance of mixed readings does not seem to be rooted in a semantic restriction, because a wh-phrase is compatible with an existential quantifier as is shown in (9).

(9) Nuku-ka **mues-inka**-lul sass-ni?
a. Did anyone buy something? b. Who bought something?

In the sentence (9), *nuku* is ambiguous but *mues-inka* is fixed as 'something'. If *nuku* is interpreted as a wh-phrase, the sentence has a mixed reading as in (9b). If a K-Ø has inherent QF as a K-particle *mues-inka* does, the mixed readings (3c) and (3d) should be accepted. Accordingly I assume that K-Øs do not have inherent QF and they are variables in terms of QF and a Korean wh-phrase is a variable bound by a wh-quantifier.

3.1.2 Derivational Quantifiers for K-Øs. What functions as wh-quantifier in Korean wh-questions? A-R Kim (2000) argues COMP_{wh} carries the function of wh-quantifier. The argument presumes substantial difference between COMP_{wh} and $\text{COMP}_{\text{y/n}}$. The difference is verified by the scope of in-situ wh-phrase in English. As Baker (1970) points out, an in-situ wh-phrase has ambiguous scopes in a structure like (10).

(10) Who remembers who met *whom*?

(11) a. Bill remembers who met whom.
b. Bill remembers who met Tom.

(12) Do you remember who met *whom*?

The sentence (10) is a wh-question involving an embedded wh-question. A sentence (11a) could be an answer to (10) if *whom* takes embedded scope. If its scope ranges over the matrix clause, a sentence (12b) could be an answer. In a yes/no-question with an embedded wh-question like (12), an in-situ wh-phrase does not show ambiguity in its scope. (12) is interpreted only as a yes/no-question. A dominant view is that all interrogative complementizers are uniformly marked with a feature [+Q] as is defined in Chomsky (1977) and Chomsky (1995), and the feature [+Q] is the licensing condition of a wh-phrase as May's (1985) WH-criterion

states. If that is the case, the sentence (12) is exactly the same as (10) in terms of licensing condition of a wh-phrase and hence the in-situ *whom* in (12) should take ambiguous scopes. The contrast in scope of in-situ wh-phrase clearly shows that $COMP_{wh}$ is different from $COMP_{y/n}$ in licensing a wh-phrase.

Another piece of evidence supporting for difference between $COMP_{wh}$ and $COMP_{y/n}$ is found in a Korean dialect spoken in Southern Kyungsang province. It distinguishes $COMP_{wh}$ from $COMP_{y/n}$ with different markers.[5] In the dialect wh-questions end with one of question markers *-no, -ko, -nko*, while yes/no-questions end with one of markers *-na, -ka, -nka*. See C-M Suh (1987) for detailed discussion. The distinction is exemplified in (13) below.[6]

(13) a. Mary-ka mues-ul sass-**na**?
'Did Mary buy something?'/ #'What did Mary buy?'
b. Mary-ka mues-ul sass-**no**?
#'Did Mary buy something?'/ 'What did Mary buy?'

In the Kyungsang dialect a K-Ø is not ambiguously interpreted in questions. The data (13) clearly indicates that it is $COMP_{wh}$ *-no* not a K-Ø that makes a sentence a wh-question in the Kyungsang dialect.

Does $COMP_{wh}$ have both [+Q] and [+OP] features, which comprise the wh-quantifier? A wh-question marker *-no* is a morphological realization of $COMP_{wh}$ and it has [+Q] feature. The $COMP_{wh}$ *-no* also has a feature [+OP] because it must co-occur with at least one K-Ø.

(14) a. *Mary-ka computer-lul sass-no? 'Did you buy a computer?'
b. Mary-ka computer-lul *ence* sass-no? 'When did you buy a computer?

The sentence (14a) does not contain a K-Ø and it is ungrammatical. It is rendered grammatical by the addition of a K-Ø *ence* in (14b). Under the assumption that K-Øs are variables, a sentence with a K-Ø is an open proposition. Since $COMP_{wh}$ must occur in a sentence with a K-Ø, it has a feature [+OP]. $COMP_{wh}$ *-no* has both properties of wh-quantifier, [+Q] and [+OP].

For the existential force of a K-Ø, A-R Kim (2000) posits existential (∃-) quantifier, which comes into the derivation accompanying a [-OP] complementizer.

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5. Chinese also shows a similar distinction. A sentence is understood as a yes/no-question with an ending marker*ma*, while it is understood as a wh-question with an ending marker*ne* as in (i).
(i) a. Ni mai le shenme **ma**? b. Ni mai le shenme **ne**?
You buy past thing Q You buy past thing Q
'Did you buy anything?' 'What did you buy?'

6. Korean native speakers easily tell whether a question like (i) is a yes/no-question or a wh-question.

(i) Nuku-ka wass-ni?

If the primary phonological prominence falls on*nuku*, the sentence is understood as a wh-question. If it falls on the verb*wass*, the sentence is understood as a yes/no-question. The same pattern holds in the Kyungsang dialect. In (13a) the verb*sass* is prominent, while in (13b)*mues* is prominent.

According to A-R Kim (2000), COMPs of wh-questions and concessive clauses are [+OP] and other complementizers are [-OP].[7] The assumption is based on the fact that a K-Ø can be existentially interpreted in any clause minus the two environments.

I have introduced derivational wh-quantifier and ∃-quantifier for the quantificational force of K-Øs, which are applied only to K-Øs in the course of a structure-building derivation. Accordingly it should be noted that the adopted derivational ∃-quantifier, which is credited to Heim's (1982) default existential closure, is applied before a level where Heim's ∃-quantifier binds indefinite NPs. Heimian ∃-closure is prefixed before nuclear scope at a representation (interface) level and quantifies over an indefinite as shown in (15).

(15) a. If a man is lonely, he often buys a cat. Heim (1982:136)
b. Often(x) [man(x) ∧ x is lonely]∧∃y[cat(y) ∧ x buys y]
quantifier restrictive clause nuclear scope

In (15) an adverbial quantifier *often* quantifies an indefinite NP *a man* in the restrictive clause. An NP *a cat* in the nuclear scope is quantified by Heim's ∃-quantifier.

The K-Øs are unspecified even for the indefiniteness. A K-Ø becomes a wh-phrase and an indefinite if it is bound by a wh-quantifier and derivational ∃-quantifier, respectively. An indefinite K-Ø, which is bound by the derivational ∃-quantifier, will go through a similar quantification with (15). Let me exemplify it with a sentence below.

(16) a. **Nuku**-ka o-myon, Mary-nun hangsang koyangi-lul senmulhanta.
Person-nom come-if M-top always cat-acc present
'If someone comes, Mary always presents him with a cat.'
b. ∃[nuku∃-ka o-myon$_{(-OP)}$] Mary-nun hangsang koyangi-lul senmulhanta
c. Always(x) [person(x) ∧ x comes] ∃y[cat(y) ∧ Mary presents x with y]

In the derivation (16), *nuku* is bound by derivational ∃-quantifier and quantified as indefinite at a stage of structure-building derivation like (16b), first. When the structure is completely built and enters into an interpretation level, the indefinite *nuku* is universally quantified by *always* as in (16c). Strictly speaking, accordingly, derivational ∃-quantifier assigns indefiniteness to K-Øs rather than existential force. In this paper, however, I will continue to use the term existential force to refer to indefiniteness of a K-Ø.

3.2 Analysis of K- Interpretations

3.2.1 Derivational Quantification. I have made the assumptions that a K-Ø is a variable and needs to be bound by one of three quantifiers: COMP$_{wh}$,

7. The complementizer of relative clause is [+OP], but it is not qualified for a quantifier because it does not have QF.

$COMP_{conc}$ and (derivational) ∃-quantifier. It is in our interest, then, to develop a binding mechanism between a K-Ø and a quantifier. The mechanism must explain the pattern of K-Ø interpretations we saw in section 2, among many possible interpretations. The interpretations are featured by two facts. One is the exclusive ATB-reading of clause-mate K-Øs and the other is an acceptable mixed reading of two K-Øs in separate clauses.

I propose Derivational Quantification as is presented in (17), which I adopt and revise A-R Kim's (2000) proposal.

(17) Derivational Quantification
   a. Quantifiers are active only when they are merged into the derivation
   b. Default ∃-quantifier is optionally activated.
   c. An instance of quantification makes the clause opaque to other instances of quantification.

Being "active" refers to binding a K-Ø. Following the line of derivational interpretation proposed by Epstein, et al. (1998), a condition (17a) requires that a quantifier should bind a variable only when it merges into the derivation. Wh-quantifier should bind a K-Ø to check a feature [+OP]. It is unselective in that it can bind more than one K-Ø, but there is no restriction like it has to bind all available K-Øs. The only restriction on the quantifier is to check its [+OP] when it is merged into the derivation. The derivational approach differs from Li's (1992) minimality condition, which also explains an interpretation pattern of Chinese K-Øs at LF. I will refer to Li's approach as representational. I will show derivational approach should be favored over representational one in section 3.2.2. The condition (17b) states that ∃-quantifier can but need not bind a variable. The assumption is natural, considering that ∃-quantifier comes into the derivation whenever a [-OP] COMP enters and that [-OP] COMP can occur without a K-Ø. In a sentence, for example, "Mary-ka wass-ni?" a [-OP] COMP is accompanied by ∃-quantifier. The sentence, however, does not have a K-Ø to bind and thus ∃-quantifier is not active in this sentence. The opacity condition (17c) prevents binding or quantification from occurring more than once over a clause. It will be shown that the condition has further consequences in section 4.

Given the derivational quantification, the reading pattern of (4) in the section 2 is explained as follows. When the declarative [-OP] COMP is merged to derive the embedded clause, it is accompanied by ∃-quantifier. The ∃-quantifier, however, is optionally activated. Among all possible derivations are presented three relevant to the readings in question.

(18) John-un [nuku-ka mues-ul sasstako] saengkakha-ni_{wh}?
   a. *∃-quantifier is activated
      i. [nuku-ka mues-ul sassta-ko]
      ii. ∃[nuku-ka mues-ul sassta-ko]
      iii. [J-un ∃[**nuku-ka mues-ul sassta-ko**] saengkakha-*ni_{wh}]

b. *∃-quantifier is activated
   i. [nuku-ka mues-ul sassta-ko]
   ii. ∃[nuku-ka mues-ul sassta-ko]
   iii. [J-un ∃[**nuku-ka** ***mues**$_{wh}$**-ul sassta-ko**] saengkakha-ni$_{wh}$]

c. ∃-quantifier is not activated
   i. ∃[nuku-ka mues-ul sassta-ko]
   ii. [J-un [nuku$_{wh}$-ka mues$_{wh}$-ul sassta-ko] saengkakha-ni$_{wh}$]

∃-quantifier could be activated and binds both K-Øs as in (18a-ii). An active quantifier and bound K-Øs at the stage are underlined. The opaque domain is represented in shadow. At the stage (18a-iii) COMP$_{wh}$ cannot bind a variable because there is no free K-Ø. Hence the derivation (18a) crashes. If the activated ∃-quantifier binds just one K-Ø as in (18b-ii), the other K-Ø is still free when COMP$_{wh}$ is merged. At the stage (18b-iii), however, the free K-Ø is not available for the wh-quantification because it sits in an opaque domain. The derivation (18b) also crashes because the derived representation contains a free variable and a COMP whose [+OP] feature remains unchecked. The opacity condition does not allow clause-mate K-Øs to be separately quantified. If ∃-quantifier is not activated as in (18c), the embedded clause is transparent and both K-Øs are available for COMP$_{wh}$. According to this derivation both K-Øs are interpreted as wh-phrases.

When two K-Øs appear in different clauses as in (5), a mixed reading is allowed as well as an ATB-reading. The additional mixed reading is obtained from a derivation like (19).

(19) Nuku-ka [Mary-ka mues-ul sasstako] saengkakha-ni$_{wh}$?
   a. i. ∃[Mary-ka mues-ul sassta-ko]
      ii. ∃[Mary-ka mues-ul sassta-ko]
      iii. [Nuku$_{wh}$-ka ∃[**Mary-ka mues-ul sassta-ko**] saengkakha-ni$_{wh}$]
   b. i. ∃[Mary-ka mues-ul sassta-ko]
      ii. [Nuku$_{wh}$-ka ∃[Mary-ka mues$_{wh}$-ul sassta-ko] saengkakha-ni$_{wh}$]

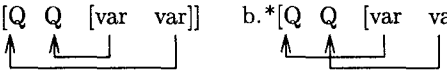
At the stage of forming the embedded clause, ∃-quantifier enters into the derivation. It could be activated or not. If it is as in (19a-ii), it binds *mues* and then at the stage (19a-iii) COMP$_{wh}$ binds *nuku*. The derivation produces a mixed reading. If ∃-quantifier is not activated as in (19b), both K-Øs are bound by COMP$_{wh}$ at a later stage like (19b-ii). The third example in section (6), which involves scrambling, favors derivational account over representational one. It will be discussed in the following section.

3.2.2 Derivational vs. Representational. Some readers, who are aware of Li's (1992) minimality condition,[8] may be doubtful about the motivation of derivational quantification since the two reading patterns shown in (18) and (19) are

8. Minimality Condition

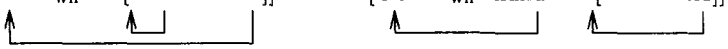
correctly predicted by Li's minimality condition. The condition prevents a quantifier from binding a variable across a variable-binding quantifier at LF. The condition is illustrated as in (20).

(20) a.*[Q Q [var var]] b.*[Q Q [var var]]



The mixed readings (18b) and (19a) would be represented like (21a) and (21b), respectively in accordance with the minimality condition.

(21) a. *[$COMP_{wh}$ ∃[nuku mues]] b. [$COMP_{wh}$ nuku ∃[mues]]

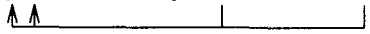


For a mixed reading in (21a) two K-Øs should be linked to separate quantifiers. The link to $COMP_{wh}$ crosses over ∃-quantifier which links to a K-Ø as in (21a), which violates the minimality condition. The link in (21b), on the other hand, does not violate minimality condition. The ATB wh-reading of (18c) obtains through linking of both K-Øs to $COMP_{wh}$, with ∃-quantifier binding no variable.

Compared with derivational quantification (17), Li's (1992) minimality condition disallows the same phenomenon that the opacity condition (17c) bars, that is, clause-mate K-s are bound separately. According to Li's minimality a quantifier seems to be able to bind no variable. It should be noted, however, that it is the case only for ∃-quantifier. Let us array the quantifiers of (21a) in the reversed order.

(22) a. John-un [nuku-ka mues-ul sass-nunko$_{wh}$] an-ta.[9]
*'John knows someone bought something.'

b. *[∃ $COMP_{wh}$[nuku mues]]



The sentence (22) has ∃-quantifier in the matrix and $COMP_{wh}$ in the embedded clause. Minimality condition predicts that both K-Øs can be bound by ∃-quantifier resulting in ATB existential reading. It is not an acceptable reading, however, in spite of absence of an intervening variable-binding quantifier. To rule out the reading, minimality condition should be combined with a postulation that only ∃-quantifier can bind no variable. This postulation amounts to the optional activation of ∃-quantifier, the condition (17b) of derivational quantification.

The condition (17a) of derivational quantification differentiates derivational quantification from minimality condition, which is representational since it assumes quantification or binding occurs at LF. Let us examine the difference through an example involving scrambling like (23).

The linking of A with B [... A ... B] obeys Minimality iff there is no intervening C [A ... C... B] such that C is linked to another element D, D ≠ B ≠ A.

9. C-M Suh (1987) observes that the Kyungsang dialect distinguishes interrogative complementizers even in embedded clause. According to him an embedded wh-question is marked with-*unko*, while embedded yes/no-question is with-*unka*.

(23) *Mues*-ul$_i$ John-un [nuku-ka t$_i$ sasstako] saengkakha-ni$_{wh}$?.
i. ∃[nuku-ka mues-ul sasstako]
ii. ∃[nuku$_\exists$-ka mues-ul sasstako]
iii. [Mues-ul$_i$ John-un ∃[**nuku$_\exists$-ka t$_i$ sasstako**] saengkakha]
iv. [Mues$_{wh}$-ul$_i$ John-un ∃[**nuku$_\exists$-ka t$_i$ sasstako**] saengkakha-ni$_{wh}$]

In the sentence (23) a K-Ø *mues* scrambles out of the embedded clause. We saw that before *mues* scrambles only ATB-reading is obtainable as in (4). Scrambling makes another reading (4c) available. If ∃-quantifier is activated at the stage of forming the embedded clause, and binds only *nuku*, *mues* is free when it scrambles as in (23-iii). The scrambled *mues* is bound by COMP$_{wh}$ at the stage (23-iv). (I assume that scrambling occurs before the matrix COMP merges.) In the derivation (23), the opacity condition is circumvented because *mues* is placed outside of the opaque domain via scrambling. This is how a mixed reading is additionally obtained in scrambling data.

In accordance to Li's representational approach, quantification occurs at LF. Minimality condition also predicts the acceptable mixed reading of (23). The link between COMP$_{wh}$ and *mues* does not cross over -quantifier.

(24) [COMP$_{wh}$ mues$_i$ ∃[nuku t$_i$]]

The representational approach, however, should appeal to 'undo scrambling' suggested by Saito (1989) for a case like (25).

(25) *Mues*-ul$_i$ John-un [nuku-ka t$_i$ sass-nunko$_{wh}$] an-ta.
a. 'John knows who bought what.'
b. 'John knows who bought something.'

(26) a. ∃[t$_1$ COMP$_{wh}$ [nuku mues$_1$]] b. ∃[mues$_i$ COMP$_{wh}$[nuku t$_i$]]

In accordance with representational approach, *mues* in (25) should go back to the original position for the wh-reading as in (26a), since proper binding condition requires a quantifier to c-command its variable. *Mues* should not go back to its original position to be existentially quantified as in (26b). Although the representational approach can explain the reading patterns of (23), and (25), it is possible only when it adopts optional "undo scrambling".

Derivational approach, on the other hand, can do without such an extra operation. The readings (25a) and (25b) are obtained from the derivations (27a) and (27b), respectively.

(27) a. i. [nuku-ka mues-ul sass-nunko$_{wh}$]
ii. [nuku$_{wh}$-ka mues$_{wh}$-ul sass-nunko$_{wh}$]
iii. John-un [**nuku$_{wh}$-ka mues$_{wh}$-ul sass-nunko$_{wh}$**] an-ta]
iv. ∃[Mues$_{wh}$-ul$_i$ John-un [**nuku$_{wh}$-ka t$_i$ sass-nunko$_{wh}$**] an-ta]
b. i. [nuku-ka mues-ul sass-nunko$_{wh}$]
ii. [nuku$_{wh}$-ka mues-ul sass-nunko$_{wh}$]
iii. [John-un [**nuku$_{wh}$-ka mues-ul sass-nunko$_{wh}$**] an]
iv. ∃[Mues-ul$_i$ John-un [**nuku$_{wh}$-ka t$_i$ sass-nunko$_{wh}$**] an-ta]
v. ∃[Mues$_{\exists}$-ul$_i$ John-un [**nuku$_{wh}$-ka t$_i$ sass-nunko$_{wh}$**] an-ta]

Mues is wh-quantified in (27a) and free in (27b) when it scrambles. The free *mues* is bound by ∃-quantifier in the matrix clause as in (27b-v).

Furthermore, we can find data which show evidence against "undo scrambling".

(28) a. *Mary-to mues$_{wh}$-ul sass-ni?
b. Mues$_{wh}$-ul$_i$ Mary-to t$_i$ sass-ni?

The sentence (26a) is an example of a phenomenon called "intervention effect", a scope interpretation at LF. See Beck and Kim (1997), A-R Kim (2001), among others for more discussion. A wh-phrase must not be preceded by a focus expression like *Mary-TO* "also". If the wh-phrase precedes the focus expression via scrambling as in (28b), the sentence becomes grammatical. It is equally applied to the embedded clause.

(29) a. *John-un [Mary-to mues$_{wh}$-ul sass-nunko$_{wh}$] an-ta.
b. Mues$_{wh}$-ul$_i$ John-un [Mary-to t$_i$ sass-nunko$_{wh}$] an-ta.

The sentence (29a) is ungrammatical for the same reason as (28a).[10] In (29b) *mues* scrambles to the matrix clause and it is ruled in. According to representational approach *mues* **must** go back to the original position to be properly bound (c-commanded) by COMP$_{wh}$ at LF. If it goes back, however, the structure will be unacceptable as is (29a). Hence it **cannot** go back. The sentence (29b) imposes a dilemma on the representational analysis. In derivational approach, however, this dilemma does not occur because it need not rely on "undo scrambling" for K-Øs in any structure. Given the condition that a quantifier is activated only when it is merged, the quantifier cannot bind a variable which has not entered into the derivation yet. According to derivational quantification, proper binding is virtually tautology.

10. Lee and Tomioka (2000) claim that intervention effect becomes weaker in embedded context like (29a). C-M Lee (personal conversation) agrees with Lee and Tomioka.

4. Consequences of Opacity Condition

The opacity condition seems to be ad hoc, motivated to prevent clause-mate K-Øs from being separately quantified. The idea of the condition, however, is supported by the ATB-interpretation of clause-mate reflexive pronouns in Korean and Japanese. It is well known that a reflexive can take a long-distance antecedent in those languages as shown in (30).

(30) [$_{IP2}$ John$_2$-un [$_{IP1}$ Tom$_1$-i caki$_{1/2}$-lul pinanhanta]-ko saenkakhan-ta]
'John$_2$ thinks that Tom$_1$ criticizes himself$_1$/him$_2$.'

The reflexive *caki* in the embedded clause could refer to *John* as well as *Tom* in (30). If there are two reflexives in the embedded clause, they should refer to the same antecedent as illustrated in (31).

(31) [John-un [Tom-i **caki** kulim-ul **caki** tongsaeng-eykey cuessta]-ko saenkakhan-ta]
a. 'John$_2$ thinks Tom$_1$ gave **self$_1$'s** picture to **self$_1$'s** brother.'
b. 'John$_2$ thinks Tom$_1$ gave **self$_2$'s** picture to **self$_2$'s** brother.'
c. *'John$_2$ thinks Tom$_1$ gave **self$_1$'s** picture to **self$_2$'s** brother.'
d. *'John$_2$ thinks Tom$_1$ gave **self$_2$'s** picture to **self$_1$'s** brother.'

The two reflexives should have an ATB-reference. They cannot refer to different antecedents. Howard and Niyekawa-Howard (1976) observe the same ATB-effect in Japanese.

We saw that scrambling circumvents the opacity condition in the K-Ø interpretations. Scrambling does circumvent the condition in the reflexive interpretation.

(32) [John-un **caki** kulim-ul$_i$ [Tom-i t$_i$ **caki** tongsaeng-eykey cuesstako] saenkakhan-ta]
a. 'John$_2$ thinks Tom$_1$ gave **self$_1$'s** picture to **self$_1$'s** brother.'
b. 'John$_2$ thinks Tom$_1$ gave **self$_2$'s** picture to **self$_2$'s** brother.'
c. *'John$_2$ thinks Tom$_1$ gave **self$_1$'s** picture to **self$_2$'s** brother.'
d. 'John$_2$ thinks Tom$_1$ gave **self$_2$'s** picture to **self$_1$'s** brother.'

In the sentence (32), a mixed reference is obtained without violating the opacity condition. When *Tom* enters into the derivation, it can bind both reflexives. If that is the case, (32a) reading is obtained. If *Tom* binds only one reflexive and the free one scrambles, a mixed reference (32d) is obtained. Though the opacity condition (17c) per se cannot apply to the reference of reflexives, its idea obviously holds for the ATB-reference. A-R Kim and Kitagawa (2002) suggest a relativized opacity to accommodate both ATB-interpretations of K-Øs and reflexives.[11]

11. Relativized Opacity

Another motivation for the opacity condition is island effect of wh-island in Korean.

While complex NP (henceforth CNP) does not show island effect in Korean, Japanese and Chinese, wh-island imposes conflicting arguments.

(33) a. Ni xiang-zhidao [shei mai-le **shenme**]?
You wonder [who bought what]
'What do you wonder who bought?
b. *Satoo-wa [Suzuki-ga **nani**-o tabeta ka-dooka] oboeteimasu-ka?
Satoo-top Suzuki-nom what-acc ate whether remember-Q
'What does Satoo remember whether Suzuki ate?'

In a Chinese example (33a), a wh-word *shenme* takes the matrix scope over a wh-clause. Huang (1982) claims that LF is not subject to Subjacency based on (33a). In a Japanese example (33b), on the other hand, *nani* cannot take the matrix scope,[12] based on which Nishigauchi (1990) makes the opposite claim.

In Korean wh-islands seem to be more perplexing in terms of island effect.[13] *know* cannot. It is inferable that the complement of *know* is either a true proposition or a set which contains a true proposition. In the sentence (i) if the wh-phrase takes wide scope, the complement cannot form a well-formed proposition because of a missing argument. Therefore it cannot express a set of propositions, let alone including a true position.

(34) a. John-un [Mary-ka mues-ul sassnun-ci] kungkumhaehass-ni$_{wh}$?
'What did John wonder whether Mary bought t?'

(35) John-un [nuku-ka mues-ul sassnun-ci] kungkumhaehass-ni$_{wh}$?
a. 'Who did John wonder bought what?'
b. *'Who did John wonder what t bought t?'
c*'What did John wonder who bought t?'

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a. Opacity: One actual instance of head-licensing makes the licensing domain opaque.

b. Domain: The maximal projection of the licensing head is the domain of licensing.

c. Relativization: This opacity prohibits the same type of licensing from outside the domain.

12. Japanese has another embedded question marker *-ka*. If *-ka* replaces *ka dooka* in the sentence (b), the sentence becomes more acceptable.

13. A wh-phrase cannot take the matrix scope if the matrix verb is *know* as shown in (i).
(i) *John-un [Mary-ka mues-ul sassnun-ci] a-ni$_{wh}$?
'What does John**know** whether Mary bought t?'
The example, however, should not be considered as a counter example of the matrix scope over wh-island. The verb *know* belongs to factive verbs according to Kiparsky and Kiparsky (1979). The complement of factive verbs expresses a true proposition. When *know* takes an interrogative complement, the complement expresses a set of proposition rather than a proposition. Yet it is contrasted with that of a non-factive verb *wonder*.
(ii) a. #John knew who came, but actually nobody came.
b. John wondered who came, but actually nobody came.
'Who came' is a set of propositions expressing "someone came'. We can see from (ii) that the complement of *wonder* can be an empty set, but that of

The embedded question marker *-ci* represents both yes/no- and wh-questions. If *-ci* represents $COMP_{wh}$ it must bind a K-. If it represents $COMP_{y/n}$ it cannot. In (34) *-ci* should be $COMP_{y/n}$. In (35) *-ci* is $COMP_{y/n}$ in the reading (35a), but it is $COMP_{wh}$ for the readings (35b) and (35c). If follows that a wh-phrase takes the matrix scope over a yes/no-question but it cannot over a wh-question. To put it in terms of island, it seems that wh-question show island effect while yes/no-question does not. It follows that in Korean it is only wh-question that shows island effect among all the island constructions including CNP, subject clause and adjunct clause.

If a movement-based approach assumes subjacency at LF as in Nishigauchi (1990) and Richards (2000), it should explain how subjacency is circumvented in all the island constructions except wh-question. If subjacency is not adopted as in Huang (1982), island effect of wh-question should be explained. There is a third approach to in-situ wh-questions. It does not assume covert wh-movement as in Aoun and Li (1993), Reinhart (1995), A-R Kim (2000). The non-movement approach has to explain the seeming island effect of wh-question, without turning to subjacency.

If I may adopt the non-movement approach without discussing how it is justified, the separate scopes of wh-phrases in (35b) and (35c) violate the opacity condition.

(36) John-un [nuku-ka mues-ul sassnun-ci_{wh1}] mules-ni_{wh2}
i. [$_{CP1}$ $nuku_{wh1}$-ka mues-ul sassnun-ci_{wh1}]
ii. [$_{CP2}$ John-un [$_{CP1}$ **$nuku_{wh1}$-ka $mues_{wh2}$-ul sassnun-ci_{wh1}**]mules-*ni_{wh2}]

At the stage of CP1, ci_{wh} binds *nuku* as in (36-i), making CP1 opaque. At the stage of forming CP2, ni_{wh} cannot bind *mues*, which sits in an opaque domain. The seeming island effect of wh-question in (35b) and (35c) is violation of the opacity condition. We have seen that the opacity condition, which at first looks ad hoc, extends its application to analysis of ATB-interpretations of clause-mate reflexives and island effect of wh-questions within non-movement approach.

5. Concluding Remarks

In this paper I have proposed derivational quantification to account for the multiple interpretations of K-s. The proposal presumes that Korean wh-phrases are just variables (K-Øs) and they are bound by the wh-quantifier, $COMP_{wh}$. Derivational quantification states that a quantifier binds a variable only when it merges into the derivation. The derivational approach is favored over representational approach in explaining data involving scrambling a K-Ø. A condition in derivational quantification is the opacity condition. It prevents quantification from applying more than once in the same clause. The condition can also explains interpretation patterns of reflexive pronouns. Its application goes further to accounting for the island effect manifested by wh-question without adopting wh-movement in Korean.

References

Aoun, Joseph and Yen-hui A. Li 1993. *Wh*-Elements in Situ: Syntax or LF? *Linguistic Inquiry* 24:199-238.

Baker, C. Lee. 1970. Notes on the Description Questions: the role of an abstract question morpheme. *Foundations of Language* 6:197-219.

Beck, Sigrid and Shin-sook Kim. 1997. On Wh- and Operator Scope in Korean. *Journal of East Asian Linguistics* 6:4. 293-338.

Chang, L. 1997. Wh-in-situ Phenomena in French. Master's thesis, Univ. of British Columbia.

Cheng, Lisa L-S and Johan Rooryck. 2000. Licensing WH-in-situ. *Syntax* 3: 1-19.

Choe, Hyun-sook. 1995. Focus and Topic Movement in Korean and Licensing. In Kiss, K. ed. *Discourse Configurational Languages.* Oxford Univ. Press. New York. 269-334.

Chomsky, Noam. 1973. Conditions on Transformations. *A Festschrift for Morris Halle.* 232-286.

Chomsky, Noam. 1977. On Wh-movement. In Culicover, P., Waswo, T. & Akmajian, A. eds. *Formal Syntax.* New York: Academic Press. 71-132.

Chomsky, Noam. 1995. *Minimalist Program.* Massachusetts: MIT Press.

Chung, Dae-ho. 1996. *On the Representation and Licensing of Q and Q-Dependents.* Ph. D. Diss. Univ. of Southern California.

Epstein, Samuel D., Erich M. Groat, Ruriko Kawashima, and Hisatsugu Kitahara. 1998. *A Derivational Approach to Syntactic Relations.* New York: Oxford Univ. Press.

Heim, I. 1982. *The Semantics of Definite and Indefinite Noun Phrases.* Ph. D. Diss. Univ. of Massachusetts, Amherst.

Higginbotham, James and Robert May. 1981. Question, quantifiers and crossing. *The Linguistic Review.* 1: 41-80.

Howard, Irwin and Agnes M. Niyekawa-Howard. 1976. Passivization. *Syntax and Semantics* 5: 201-237. Academic Press. New York.c

Huang, C-T. James. 1982. *Logical Relations in Chinese and the Theory of Grammar.* Ph. D. Diss., MIT.

Kim, Ae-ryung. 2000. *A Derivational Quantification of "WH-Phrases".* Ph. D. Diss. Indiana University.

Kim, Ae-ryung. 2001. Intervention Effect of Negative Polarity Items in Korean. *Researching and Verifying an Advanced Theory of Human Language* vol. 5. Kanda University of International Studies.

Kim, Ae-ryung and Yoshihisa Kitagawa. 2002. Opacity in Japanese and Korean. *Japanese/Korean Linguistics* 10: 601-614.

Kim, Soo-won. 1989. Wh-Phrases in Korean and Japanese are QPs. *MIT Working Papers in Linguistics* 11. 119-138.

Kiparsky, Paul and Carol Kiparsky. 1979. Fact. In Napoli, D.J. and E. N. Rando eds. *Syntactic Argumentation.* Washington: Georgetown University Press.

Kuroda, S-Y. 1965. *Generative Grammatical Studies in the Japanese Language.* Ph. D. Diss. MIT.

Lee, Kisuk and Satoshi tomioka. ms. LF Blocking Effects Are Topic Effects: WH Questions in Japanese and Korean.

Li, Yen-hui A. 1992. Indefinite *Wh* in Mandarin Chinese. *Journal of East Asian Linguistics.* 1: 125-155.

May, Robert. 1985. *Logical Form: Its Structure and Derivation.* MIT Press.

Nishigauchi, T. 1990. *Quantification in the Theory of Grammar.* Dordrecht: Kluwer Academic Press.

Reinhart, Tanya. 1995. Interface Strategies. *OST Working Papers.* Utrecht.

Richards, Norvin. 2000. An Island Effect in Japanese. *Journal of East Asian Linguistics* 9: 187-205.

Saito, M. 1989. Scrambling as Semantically Vacuous A'-Movement. In Baltin, M.R. & Kroch eds. *Alternative Concepts of Phrase Structures.* Chicago: Univ. of Chicago Press.

Suh, Chung-mok. 1987. *A Study on the Interrogative Sentences in Korean* (in Korean). Seoul: Thap Press.

Suh, Chung-mok. 1989. Wh-Constructions in Korean. *Havard Studies in Korean Linguistics* 3: 517-526.

Watanabe, Akira. 1992. Wh-in-situ, Subjacency and Chain Formation. *MIT Occasional Working Paper.*

Yoon, Jeong-Me. 1999. Decomposing: Wh-Marking and Wh-Scoping Movement. *Studies in Generative Grammar* 9-1: 153-200. Seoul: The Korean Generative Grammar Circle.

Submitted on: November 4, 2002
Accepted on: December 4, 2002