

Two Types of Polarity Sensitive (PS) “ANY”*

Hyunoo Lee

This paper is concerned with the differences in distribution and meaning between the English PS *any* and its Korean equivalent *amwu-to*. I first argue that the former is an existential quantifier that must be in the scope of a monotone decreasing expression, but the latter, a universal quantifier that must take scope over a limited class of monotone decreasing expressions of which negation is typical. I then propose a sketch that formally incorporates these descriptive characterizations into their respective licensing conditions within the framework of Flexible Categorical Grammar. I finally show that the proposed analysis is capable of explaining some of the parametric differences between the two items.

1. Introduction

The distribution and interpretation of negative polarity items (NPIs) have intrigued many logicians and linguists. From the viewpoint of logic, the interpretation of NPIs has brought forth many productive discussions of monotonicity-based reasoning, and the licensing of NPIs has long been recognized as one of the central issues in linguistic theory. As one may note in the literature, any adequate account of NPIs must specify what they are and characterize their licensors and the relations they bear with them. Because these tasks eventually involve the overall design of grammar, the

*This paper is the final written outcome of a series of talks that I have given on the crosslinguistic variations of NPI licensing. For their comments, suggestions and criticisms on the main idea of this paper, I am very grateful to Anna Szabolcsi, Seungho Nam, Daeho Chung, Yookyung Kim, Chungmin Lee, Kiyong Lee, and Jaewoong Choe. I would also like to thank the audience at the 1995 International Conference on Linguistics, Hanyang University, Seoul, and the 29th Annual Linguistics Conference, Seoul National University, Seoul. A special word of thanks goes to two anonymous reviewers for their comments. I am solely responsible for any errors in this paper. This research has been supported, in part, by the 1994 Inha Research Grant.

account of NPI licensing is thought to play an important role in the grammatical theory.

Many different characterizations of NPIs and accounts have been proposed within the general framework of formal linguistics, ranging from formal syntax like the Chomskyan transformational grammar to Montague semantics and categorial grammar. These accounts provide us with the useful descriptions of the parochial and universal properties of the phenomenon in question. Nonetheless, certain issues remain unsettled and even become more controversial. Among them are whether PS *any* is a universal or existential quantifier, whether the distribution of NPIs in a sentence is syntactically or semantically conditioned, and whether the relevant condition can be stated on the surface structure of the sentence or on an inaudible level of representation like Logical Form.

Descriptive work on the distribution of NPIs also shows that their licensing differs from language to language. As an illustrative example, let us consider the sentences in (1)-(2).

- (1) a. *John criticized anyone.
 b. John didn't criticize anyone.
 c. At most three students criticized anyone.
 d. If Mary criticizes anyone at the debate, she will lose.
 e. Before Mary criticizes anyone, let's get out of here.
- (2) a. *John-un amwuto pinanhayssta.
 John-TOP anyone criticized
 'John criticized anyone.'
 b. John-un amwuto pinanhaci anhassta.
 John-TOP anyone criticize did not
 'John didn't criticize anyone.'
 c. *Kikkeshayya sey myeng-uy haksayng-i amwuto pinanhayssta.
 at most three CL-GEN student-NOM anyone criticized
 'At most three students criticized anyone.'
 d. *Mary-ka noncayng-eyse amwuto pinanhan-tamyen, cil kes-ita.
 Mary-NOM debate-at anyone criticizes-if (she) lose will
 'If Mary criticizes anyone at the debate, she will lose.'
 e. *Mary-ka amwuto pipnanhaki ceney, yeki-se naka-ca.
 Mary-NOM anyone criticize before here-from go out-let's
 'Before Mary criticizes anyone, let's get out of here.'

As seen in (1), the NPI *anyone* is licensed by not only the negation *not* but also quantified NPs like *at most three students* and sentential connectives like *if* and *before*. By contrast, the Korean NPI *amwuto*, a counterpart of the English *anyone*, seems to be licensed by only the explicit use of negation, as in (2).¹ This contrast demonstrates that languages may differ with respect to what kind of expression may license NPIs. In a language such as Korean, NPIs seem to be licensed by only the negative formatives. In addition to the class of licensers of NPIs, languages differ with respect to where NPIs can occur in the simplex sentences. Let us now consider the contrast shown by (3).

- (3) a. *Anyone didn't come yesterday.
 b. Amwuto ecey oci anhassta.
 anyone yesterday come did not
 'No one came yesterday.'

English does not allow the PS *anyone* to be used as subject in a simple matrix clause like (3a).² Unlike English, Korean does sanction this option, as in (3b). Finally, languages differ with respect to what conditions should be placed on the relation between NPIs and their licensers. Consider the contrast between (4a) and (4b).

¹ The grammaticality judgment of sentences like (2e) varies among people. Researchers like Lee (1992) judge them grammatical, but others, including myself, rule out them as unacceptable. For those who belong to the latter group, (2e) must be replaced by (i).

- (i) Mary-ka nwukwu-lul pipnanhaki ceney, yeki-se naka-ca.
 Mary-NOM anyone-ACC criticize before here-from go out-let's
 'Before Mary criticizes anyone, let's get out of here.'

That is, in a sentence introduced by the subordinators *ceney* 'before' or *tamyen* 'if', an NPIs of the form *nwukwu* ('who')-case marker or its contracted form is used instead of *amwuto*.

² This does not mean that NPIs cannot be used as the subject of a matrix clause. As noted by Jackendoff (1972), they can occur as subject in inverted sentences like those in (i).

- (i) a. Never did anyone give John anything.
 b. Only then didn't any of my friends arrive on time.

- (4) a. John didn't think that Mary met anyone. (Neg-Raising Constructions)
- b. *John-un Mary-ka amwuto mannassta-ko sayngkakhaci anhassta.
 John-TOP Mary-NOM anyone meet-that think did not
 'John didn't think that Mary met anyone.'

The grammaticality of (4a) shows that in a context like the Neg-Raising construction the NPI *anyone* may be separated from its licenser by a clause boundary. By contrast, the Korean equivalent must have a clausemate licenser even in the Neg-Raising construction, as in (4b).³

We have so far seen that different languages may make use of different modes of NPI licensing. English and Korean are sharply contrasted in the respects illustrated by (1)-(4). In this paper I would like to show that the aforementioned contrasts can be naturally reduced to the proper characterization of the quantificational force of the NPIs in both languages. Approaching the problem of whether PS "ANY" is a universal or existential quantifier from the viewpoint of language parameterization, I first argue that the English *any* is an existential quantifier, but its Korean equivalent *amwu-to*, a universal quantifier.⁴ As our discussion of the scopal properties of these items shows, the English PS *any* must be under the scope of its licenser, its Korean counterpart must be over the scope of its licenser. This enables us to explain the parametric variations of NPI licensing illustrated in (2)-(4).

This paper is organized as follows. In section 2 I discuss some pieces of evidence that support our semantic characterization of the English PS *any* and the Korean equivalent *amwu-to*. In section 3 I first show that the

³ People are divided as to the grammaticality judgment of such sentences as (4b). Some people think that they are grammatical but sound awkward for some reasons. Others find them ungrammatical but acceptable. Finally, people like me judge them neither grammatical nor acceptable.

⁴ A few words are in order about the structure and meaning of *amwu-to*. Here *_* stands for the position in which a noun may optionally occur. If a noun is realized, the whole phrase consists of two words, the indeterminate *amwu* and that noun to which *to* is attached (e.g. *amwu haksayng-to* 'any student(s)'). Note that another particle may be attached to the noun before *to* (e.g. *amwu haksayng-hanthey-to* 'to any student(s)'). If no noun is realized, the whole phrase consists just one word *amwuto*, meaning 'anyone'.

Korean *amwu-to* is an NPI which is licensed only by the overt occurrence of negation or a limited class of lexically specified negative expressions. Given this and the characterization of *amwu-to* as a universal quantifier, I propose a way of handling its scopal properties and deriving the semantic interpretation of a sentence it is part of in the framework of Flexible Categorical Grammar. It will be shown that our analysis can account naturally for the distributional differences between English and Korean NPIs, which themselves pose a difficult problem for any alternative accounts of NPI licensing. This paper is concluded with a discussion of some residual problems and a possible solution to them.

2. Parameterizing Polarity Sensitive "ANY"

As I mentioned in the previous section, the precise characterization of PS *any* has long been a core issue in the study of the polarity sensitivity phenomena in natural languages. One position, advocated by Quine (1960), Vendler (1967), Horn (1972), Lasnik (1975), and Valencia (1991), holds that the English PS *any* is a universal quantifier.⁵ The other position, taken by Klima (1964), Ladusaw (1979, 1983), Linebarger (1980), and Carlson (1980), argues that it is an existential quantifier. In this section I would like to argue for a parametric characterization of PS "ANY" on which the English *any* is an existential quantifier but its Korean counterpart *amwu-to* is a universal quantifier.

In the debate over the precise semantic nature of PS *any*, a great number of arguments in favor of the *existential* characterization have been proposed. Virtually all the arguments seem to rely on the scopal peculiarities or cooccurrence restrictions of the universal or existential quantifiers. For a discussion of this point, see Ladusaw (1979), Linebarger (1980), and Carl-

⁵ More precisely, this approach takes the word *any* to be a universal quantifier irrespective of whether it occurs in the context of a monotone decreasing expression, as in (1), or in the context of a modal or generic operator, as in (i).

- (i) a. Anyone can/will help you.
- b. Anyone has the price of hamburger.

The examples in (i) illustrate the so-called free choice (FC) *any*. I assume that PS *any* and FC *any* are distinct. For a discussion, see Vendler (1967), Kadmon and Landman (1990), and Krifka (1990).

son (1980), among others. Of these two types of argument, the one that makes use of a cooccurrence restriction sounds the more theory-neutral and more robust. One convincing argument of this type is provided by Carlson (1980). Consider the expressions in (5)-(7) (= his (21)-(23), respectively).

(5) $\left\{ \begin{array}{l} \text{nearly} \\ \text{almost} \\ \text{just about} \end{array} \right\} \quad \left\{ \begin{array}{l} \text{all} \\ \text{every} \\ \text{each} \end{array} \right\}$

(6) $\left\{ \begin{array}{l} \text{*nearly} \\ \text{almost} \end{array} \right\} \quad \left\{ \begin{array}{l} \text{some} \\ \text{several} \end{array} \right\}$

- (7) a. *John doubts that nearly/almost anyone is in that room there.
 b. *Has nearly anyone been there before?

As shown by the contrast between (5) and (6), the universal quantifiers but not the existential ones may be modified by an adverb like *nearly*, *almost*, and *just about*. The fact that these adverbs cannot modify the NPI *anyone* in (7) strongly suggests that this indefinite is an existential.⁶

The cooccurrence test above gives rise to a very interesting result, when applied to the Korean sentences that contain an *amwu-to* phrase. Let us consider the sentences in (8)-(9).

(8) a. John-i keyu motun chayk-ul ilkessta.
 John-NOM almost all book-ACC read
 'John read almost all books.'

b. *John-i keyu etten chayk-ul ilkessta.
 John-NOM almost some book-ACC read
 'John read almost some books.'

(9) John-i keyu amwu chayk-to ilkci anhassta.
 John-NOM almost any book-PAR read did not
 'John did not read any books.'

The contrast between (8a) and (8b) shows that the adverb *keyu*, the

⁶ As pointed out by Carlson (1980), FC *any* can, of course, be modified by those adverbs, as in (i) (= his (24)-(25)).

- (i) a. Nearly anyone can fix a leaky faucet.
 b. John will eat almost anything.

Korean equivalent to *nearly* or *almost*, can modify the universal but not existential quantifiers. Unlike English, however, Korean permits it to modify the NPI *amwu-to* in a sentence like (9). Taken together, these facts indicate that the NPI *amwu-to* is on a par with the universal quantifier.

Further evidence in favor of our parametric characterization of PS "ANY" is provided by the distributional and morphosemantic facts. Consider first the following existential sentences:

- (10) a. There was [a student] at the party.
 b. There were [some students] at the party.
 c. There were [no students] at the party.
- (11) a. *There was [John] at the party.
 b. *There were [most cats] in the garden.
 c. *There wasn't [every cat] in the garden.
- (12) There weren't [any students] in the garden.

It has long been known since Milsark's (1974) pioneering work that only a certain class of NPs can occur after the copula *be* in the existential sentences. Following Keenan (1991), I assume that these sentences are typically used to affirm, deny or query the existence of objects (e.g. students) with a specified property (e.g. being at the party). NPs like the bracketed ones in (10), called *existential* NPs, can naturally occur in such sentences, but NPs like the bracketed ones in (11) cannot. Of importance to the present context is the fact that existentially quantified NPs, but not universally quantified ones, are allowed in the existential sentences. Compare (10a-b) with (11c). From this and the grammaticality of (12), then, it follows that PS *any* is an existential quantifier.

In the above I argued that the English *any* is an existential in terms of the distributional fact concerning existential sentences in English. We certainly would be fully justified in claiming that the Korean *amwu-to* is a universal if we found that it cannot be used in a construction that corresponds to the English existential one. Unfortunately, Korean has no such construction with the same grammatical properties as the latter. This does not mean, however, that there is no other independently motivated evidence for our characterization of *amwu-to* as a universal quantifier. The meaning of the particle *to* attached to, an *amwu-to* phrase, provides evidence of a different sort. Let us now consider (13).

- (13) John-to wassta.
 John-also (or even) came
 ‘John came, too.’ or
 ‘Even John came.’

Dependent upon the context of use, the particle *to* is interpreted as ‘also’ or ‘even’ when it is attached to a nominal expression like the one in (13). Note also that the particle is interpreted as a conjunctive conjunction but not as a disjunctive one, in a coordinate structure like (14).

- (14) John-to Mary-to wassta.
 John-and Mary-and came
 ‘Both John and Mary came.’

The additive use in (13) and the conjunctive use in (14) just show that the particle *to* is closely related to or interpreted as a boolean meet \wedge .⁷ Given the Principle of Compositionality of Meaning, which dictates that the meaning of an NP to which the particle *to* is attached is compositionally constructed from the meanings of that NP’s parts and the particle, it is quite reasonable to say that the meaning of *to* determines the type of quantificational force of its host NP when it has an indeterminate like *amwu* as a determiner. This naturally lends itself to the conclusion that the NPI *amwu-to* must be a universal since the semantic interpretation of a universally quantified NP in the first-order predicate logic involves a boolean meet \wedge in one way or another, as in (15).

- (15) Given a model M with a nonempty set D as its domain and an assignment g , If ϕ is a formula and x is a variable, then
 $\|\forall x\phi\|_{M, g} = \text{True}$ iff for all $d \in D$, $\|\phi\|_{M, g[x/d]} = \text{True}$.

3. Scope, Monotonicity, and NPI Licensing

In the previous section, I argued for the claim that the English PS *any* is an existential but the Korean counterpart *amwu-to* is a universal, in terms

⁷ The terms ‘additive’ and ‘conjunctive’ are from Hong (1994), where a coordinate NP like the one in (14) receives only the distributive interpretation. I agree with his judgment on this.

of the distributional or cooccurrence restrictions that they have and the morphosemantic property of the particle *to*. In this section I first provide further evidence for our claim by examining the scopal properties that the two items have. I then propose their respective licensing conditions and discuss the syntax and semantics of the sentences that contain them within the framework of Flexible Categorical Grammar. Comparing the present analysis with some recent ones, I finally show that it gives an empirically superior account of the parametric variations of NPI licensing noted in section 1.

3.1. Scope Evidence

The English PS *any* and its Korean counterpart *amwu-to* present a very interesting scope difference. I note here that whereas the former may occur in a position in which a scope-bearing element must take narrow scope, the latter may occur in a position in which a scope-bearing element must take wide scope. This enables us to safely conclude that the former is an existential which is in the scope of its licenser, a monotone decreasing expression and the latter, a universal which takes scope over its licenser, negation or a lexically specified 'negative' expression. Consider (16)-(17).

(16) John didn't meet anyone.

(17) a. $\neg \exists_x \text{MEET}jx$

b. $\forall_x \neg \text{MEET}jx$

c. $\exists_x \neg \text{MEET}jx$

d. $\neg \forall_x \text{MEET}jx$

Sentence (16) may be interpreted as (17a) or its logical equivalent (17b). Under no circumstances can it be interpreted as (17c) or its logical equivalent (17d). This fact indicates that *any* is an existential if and only if it must be in the scope of its licenser, or it is a universal if and only if it must take scope over its licenser. Likewise, the Korean counterpart of (16) in (18) below may be interpreted as (17a) or (17b), but not as (17c) or (17d), which suggests the same point regarding the characterization of *amwu-to*. In other words, it is a logical consequence of the way we understand the sentences with PS "ANY" that if it is an existential it must be in the scope of its licenser and if it is a universal it must take scope over its licenser.

- (18) John-i amwuto mannaci anhassta.
 John-NOM anyone meet do not
 'John didn't meet anyone.'

We are now in a position to show that PS *any* may occur in a position in which a scope-bearing element must take narrow scope, but its Korean equivalent *amwu-to* may occur in a position in which a scope-bearing element must take wide scope. Let us first consider (19).

- (19) a. John didn't meet Mary or Sue.
 b. John didn't meet Mary and John didn't meet Sue.

As discussed by LeGrand (1975) and Ladusaw (1980), (19a) entails (19b), and vice versa. That is, the negated VP, *didn't meet Mary or Sue* is logically equivalent to *didn't meet Mary and didn't meet Sue*, as formally represented in (20).

$$(20) \lambda x \neg \text{Meet}(x, (m \vee s)) \Leftrightarrow \lambda x (\neg \text{Meet}(x, m) \wedge \neg \text{Meet}(x, s))$$

Such equivalence is a consequence of the application of De Morgan's Law, and indicates that the 'Affective' *or* must be in the scope of *not* in a sentence like (19a). Consider then the sentences in (21).

- (21) a. John didn't meet any professors or any students.
 b. John didn't meet any professors and John didn't meet any students.

As expected, (21a) and (21b) are logically equivalent, which implies that the disjunctive conjunction *or* in (21a) is under the scope of *not*. But this alone cannot guarantee that the disjuncts in (21a) are also under the scope of *not*, unless they are shown to be under the scope of *or*. Fortunately, there is a test which determines whether they can be so or not. Now consider (22)–(23).

- (22) a. Someone from every city, despises it.
 b. For every city *x*, there is someone *y* from *x* such that *y* despises *x*.
 (23) a. Every lawyer, or some professor, hates its_i's_j relatives.
 b. For every lawyer *x*, there is some professor *y* such that *x* or *y* hates *x*'s relatives.

- c. There is some professor y such that for every lawyer x , x or y hates y 's relatives.

(22a) is an example of inverse-linking anaphora. As pointed out by Higginbotham (1980) and May (1985), the bound variable construal of *it* in (22b) is possible only when the quantified NP *every city* takes scope over its dominating NP. By contrast, it is entirely impossible to interpret the pronoun *its* in (23a) as a variable bound by *every lawyer* or *some professor*. That is, neither of (23b) and (23c) is a possible interpretation of (23a). How can we account for the lack of a bound variable construal in (23a)? A simplest possible answer would be that no disjuncts can take scope over *or*, and hence over the whole coordinate NP. What I have so far shown is that the Affective *or* is necessarily in the scope of *not* and the disjunctive conjunction *or* must take scope over any scope-bearing disjunct, if there is such. We can then logically infer from these that if *or* is construed as the Affective *or* and it has a scope-bearing element as its disjunct, that scope-bearing element also must be in the scope of *not* by the transitivity of scope. This means that the *any*-phrases in (21a) are in the scope of *not*, and hence must be treated as existentially quantified NPs.

I have argued that the English PS *any* is an existential since it may occur in the context of the Affective *or* as (part of) its disjunct. This argument would be much more compelling if we could find that it cannot occur in the position where a scope-bearing element is always interpreted as taking wide scope. It seems that no constructions in English independently require a scope-bearing element in a certain position to be interpreted as taking wide scope in that position.⁸ Nonetheless, the fact noted above is sufficiently clear to give an empirical support to our characterization of PS *any*. At this point, one may reasonably ask if the same type of argument can be applied to the characterization of *amwu-to* as a universal. Interesting enough, in Korean nothing requires a scope-bearing element in a certain position to be interpreted as taking narrow scope in that position, as with the Affective *or* construction in English. But there is a construction which one may call the dual of the Affective *or* construction. Consider the sentences in (24).

⁸ Some arguments in this line have been proposed, especially by Linebarger (1980) and Carlson (1980). They are, however, relied on the scopal treatment of the *de re/de dicto* distinction, and one may cast a doubt on the whole arguments since the scopal treatment of the phenomenon is disputable.

- (24) a. John-i Mary-to Sue-to mannaci anhassta.
 John-NOM Mary-and Sue-and meet did not
 ‘John didn’t meet Mary or Sue.’
- b. John-i Mary-lul mannaci anhass-ko John-i Sue-lul
 John-NOM Mary-ACC meet did not-and John-NOM Sue-ACC
 mannaci anhassta.
 meet did not
 ‘John didn’t meet Mary and John didn’t meet Sue.’

Sentence (24a) is logically equivalent to (24b). This means that the coordinate NP, *Mary-to Sue-to*, takes scope over the negation *anhassta* ‘did not’. If the former were in the scope of the latter, (24a) would be incorrectly predicted to be logically equivalent to (25a) by virtue of De Morgan’s Law in (25b).

- (25) a. John-i Mary-lul mannaci anhass-kena John-i Sue-lul
 John-NOM Mary-ACC meet did not-or John-NOM Sue-ACC
 mannaci anhassta.
 meet did not
 ‘John didn’t meet Mary or John didn’t meet Sue.’
- b. $\lambda x \neg \text{Meet}(x, (m \wedge s)) \Leftrightarrow \lambda x (\neg \text{Meet}(x, m) \vee \neg \text{Meet}(x, s))$

Thus far I have shown that the conjunctive *to*-construction is always interpreted as taking wide scope over negation when they occur in the same clause. As shown in (26) below, the same pattern of equivalence holds even when the conjunctive construction contains an *amwu-to* phrase as one of its conjuncts.

- (26) a. John-i amwu haksayng-to amwu sensayng-to
 John-NOM any student-PAR any teacher-PAR
 mannaci anhassta.
 meet did not
 ‘John didn’t meet any student or any teacher.’
- b. John-i amwu haksayng-to mannaci anhass-ko John-i
 John-NOM any student-PAR meet did not-and John-NOT
 amwu sensayng-to mannaci anhassta.
 any teacher-PAR meet did not
 ‘John didn’t meet any student and John didn’t meet any teacher.’

Here the two sentences are logically equivalent to each other. The existence of logical equivalence in a pair of sentences like the ones in (26) thus gives convincing evidence for our characterization of the NPI *amwu-to* as a universal since the assignment of wide scope to a conjunctive *to*-phrase in relation to negation automatically ensures that any scope-bearing conjuncts of the *to*-phrase must also take scope over negation. It is plainly impossible that a coordinate NP can take wide scope over negation while its members are in the scope of that negation.

3.2. Towards a Proper Statement of the Licensing Conditions

I have so far argued that the English PS *any* is an existential that must be in the scope of a monotone decreasing expression, but the Korean equivalent *amwu-to*, a universal that must take scope over negation or an inherently negative expression. In this section I am concerned with the formal statement of the licensing conditions that incorporate these descriptive generalizations.

3.2.1. English

We begin our discussion with Ladusaw's (1979) licensing condition in (27).

- (27) Negative Polarity Items are appropriate in structures in the scope of a downward-entailing (i.e. monotone decreasing) expression. If the trigger is in the same clause as the NPI, the trigger must precede the NPI.

The standard definition of monotone decreasing is given in (28).

- (28) a. Let (B, \leq) and (D, \leq) be partially ordered sets. Then a function f from (B, \leq) to (D, \leq) is monotone decreasing iff for all $x, y \in B, x \leq y \Rightarrow f(y) \leq f(x)$.
- b. An expression is called monotone decreasing if it is interpreted as a monotone decreasing function.

Given the definition of monotone decreasing in (28), the scope requirement in (27) forces the English PS *any* to occur within an argument of a monotone decreasing expression. This explains the canonical paradigm of this item in (1), repeated as (29).

- (29) a. *John criticized anyone.
 b. John didn't criticize anyone.
 c. *At most three students* criticized anyone.
 d. *If Mary criticizes* anyone at the debate, she will lose.
 e. *Before* Mary criticizes anyone, let's get out of here.

The italicized expressions in (29)—the negation *not* in (29b), the subject *at most three students* in (29c), and the subordinators *if* and *before* in (29d–e)—are all interpreted as monotone decreasing functions. This is borne out by the following entailment fact:

- (30) a. $\| \text{danced} \| \leq \| \text{moved} \|$
 b. $\| \text{John didn't move} \| \leq \| \text{John didn't dance} \|$
 c. $\| \text{At most three students moved} \| \leq \| \text{At most three students danced} \|$
 d. $\| \text{If Mary moves, she will lose} \| \leq \| \text{If Mary dances, she will lose} \|$
 e. $\| \text{Before Sue moved, Joe got up} \| \leq \| \text{Before Sue danced, Joe got up} \|$

Since the NPI *anyone* occurs in the arguments of these monotone decreasing expressions in (29b–e), the grammaticality of the sentences results.⁹

The condition in (27) serves as a quite general description of the distribution of NPIs, but it faces two difficult problems. One is that it has to appeal to precedence to rule out a sentence like (31) since there is no definite evidence that helps to decide whether the subject position is in the scope of the negation in the same clause.

- (31) *Anyone didn't come.

To the extent that the precedence effects should be derived from something

⁹ A monotonicity-based account like Ladusaw (1979) faces two problems. One is that certain contexts, such as adversative predicates and questions, that license PS *any* are hard to define to be monotone decreasing, as shown by Linebarger (1987), Kadmon and Landman (1993). The second one, discussed by Heim (1984) and Krifka (1990), is that some of the contexts that license PS *any* are not really monotone decreasing:

- (i) a. $\| \text{a poisoned fruit} \| \leq \| \text{a fruit} \|$
 b. $\| \text{If you eat a fruit, you will feel better} \| \not\leq \| \text{If you eat a poisoned fruit, you will feel better} \|$
 c. If you eat *any* fruit, you will feel better.

more general, (27) lacks explanatory force. Furthermore, it must be supplemented by imposing a certain locality condition on the NPIs and their licensors. Linebarger (1987) and Kadmon and Landman (1993) discuss cases where Ladusaw's account would make an empirically incorrect prediction. Consider (32) (= Kadmon and Landman's (1993) (56)).

(32) *It's not the case that every boy has any potatoes.

Since *any* is in the scope of a monotone decreasing expression *not*, and since the whole context, *It's not the case that every boy has*, is monotone decreasing, Ladusaw's account incorrectly predicts that NPIs are acceptable in a sentence like (32). To cope with the problem, Linebarger (1987) proposes the Immediate Scope Constraint in (33).

(33) A negative polarity item is acceptable in a sentence *S* if in the LF of *S* the subformula representing the NPI is in the immediate scope of the negation operator. An element is in the immediate scope of NOT only if (i) it occurs in a proposition that is the entire scope of NOT, and (ii) within this proposition there are no logical elements intervening between it and NOT.

In (32) *any* occurs in the proposition that the negation *not* takes scope over, but the universal quantifier \forall intervenes between them. It is clear that Ladusaw's account is inappropriate to deal with the local requirement that the relation between NPIs and their licensors must meet.

In the above we have noted the two problems that arise from Ladusaw's account in (27). In order to avoid these problems, keeping the underlying insight of his theory, I propose to replace (27) with (34).

(34) The Licensing Condition for English NPIs

NPIs are acceptable in structures in the immediate scope of a monotone decreasing expression. An element is in the immediate scope of an operator β iff (i) α occurs in an argument of β and (ii) within this argument α is in the scope of no logical operator.¹⁰

¹⁰ (34) is a restatement of (27) as a condition on the surface structure of the sentence. I here do not intend (34) to be able to explain all occurrences of NPIs in English. As noted in fn. 9, some difficulties already exist for monotonicity-based accounts like (34), and more difficulties will arise when the examples discussed by Linebarger (1987) are considered.

To show how (34) works, I assume a specific version of Flexible Categorical Grammar where *didn't* or *not* is treated as a polymorphic expression that maps an n -ary predicate to an n -ary predicate, and subject and object NPs are expressions of type $S/(S\backslash NP)$ and $(S\backslash NP)\backslash((S\backslash NP)/NP)$, respectively.¹¹ That is, subject NPs are interpreted as generalized quantifiers (GQs) and object NPs, as lifted generalized quantifiers (LGQs), i.e. functions from n -ary relations to $n-1$ -ary relations. Given this, sentence (31) would be derived in the following manner:

$$\begin{array}{ccccccc}
 (35) & \underline{\text{Anyone}} & & \underline{\text{didn't}} & & \underline{\text{come}} & \\
 & S/(S\backslash NP) & & (S\backslash NP)/(S\backslash NP) & & (S\backslash NP) & FA \\
 & & & & & \underline{S\backslash NP} & \underline{FA} \\
 & & & & & & *S
 \end{array}$$

In (35) *not* is interpreted as monotone decreasing, and so is the negated verb *didn't come*. Neither takes the NPI *anyone* as its argument, but rather is (part of) the argument of that item. Hence (35) violates the licensing condition in (34). Consider (36).

$$\begin{array}{ccccccccccc}
 (36) & \underline{\text{John}} & & \underline{\text{didn't}} & & \underline{\text{see}} & & \underline{\text{anyone}} & & & \\
 & S/(S\backslash NP) & & (S\backslash NP)/(S\backslash NP) & & (S\backslash NP)/NP & & (S\backslash NP)\backslash((S\backslash NP)/NP) & & & FA \\
 & & & & & & & \underline{S\backslash NP} & & & \underline{FA} \\
 & & & & & & & \underline{S\backslash NP} & & & \underline{FA} \\
 & & & & & & & & & & S
 \end{array}$$

The ungrammaticality of (32) is now naturally accounted for. Consider (37), which shows how (32) would be possibly derived.

$$\begin{array}{ccccccccccc}
 (37) & \underline{\text{It's not the case that}} & & \underline{\text{every boy}} & & \underline{\text{has}} & & \underline{\text{any potatoes}} & & & \\
 & S/S & & S/(S\backslash NP) & & (S\backslash NP)/NP & & (S\backslash NP)\backslash((S\backslash NP)/NP) & & & FA \\
 & & & & & & & \underline{S\backslash NP} & & & \underline{FA} \\
 & & & & & & & & & & *S
 \end{array}$$

Composing the embedded subject *every boy* with *has any potatoes* violates the licensing condition in (34) although the latter is in the scope of the monotone decreasing *it's not the case that*. For it amounts to saying that *any*

¹¹ The two slashes, '/' and '\', refer to relative positions of a function and an argument. A function of type Y/X looks for an argument of type X to its right, and a function of type $Y\backslash X$ to its left.

is in the immediate scope of \forall . I assume that subject cannot be composed with a transitive verb to the exclusion of object. Otherwise, *every boy* and *has* would be allowed to be composed, which results in the assignment of wide scope to *any potatoes*, which is still in the scope of *it's not the case that*.¹² Note also that a general constraint prohibits the expression *it's not the case that every boy* from being composed. Hence there is no other way for (37) to meet (34).

To sum up, the English PS *any* is acceptable if it occurs in the argument of a monotone decreasing function and no other logical operator such as \forall intervenes between them.

3.2.2. Korean

In section 1 I mentioned that the Korean NPI *amwu-to* is licensed by negation and inherently negative expressions. In this section I first specify what these expressions are and attempt to give a unified characterization of the class of expressions that license *amwu-to*. I then consider how to formally state the licensing condition for this item.

Descriptive work on the distribution of NPIs in Korean shows that in addition to negation, verbs like *epsta* 'not exist' and *moluta* 'not know' license *amwu-to*, as in (38).

- (38) a. John-i *amwuto* *mannaci* *anhassta*.
 John-NOM anyone meet did not
 'John did not meet anyone.'
- b. *Amwuto* *yeki-ey* *epsta*.
 anyone here-at not exist
 'No one is here.'
- c. John-i *amwuto* *molunta*.
 John-NOM anyone not know
 'John does not know anyone.'

In an attempt to characterize such expressions as the italicized ones in (38), Nam (1993) proposes that they are interpreted as *anti-morphisms*.

¹²The VP constituency is thus crucial to NPI licensing as well as anaphor binding in English. For a discussion of why the anaphor binding in English is subject to the VP constituency, see Lee (1993).

- (39) Let (B, \leq) and (D, \leq) be partially ordered sets.
- a. A function f from (B, \leq) to (D, \leq) is *anti-additive* if and only if for all $x, y \in B$, $f(x \vee y) \Rightarrow f(x) \wedge f(y)$.
 - b. A function f from (B, \leq) to (D, \leq) is *anti-multiplicative* if and only if for all $x, y \in B$, $f(x \wedge y) \Rightarrow f(x) \vee f(y)$.
 - c. A function f from (B, \leq) to (D, \leq) is an *anti-morphism* if and only if f is anti-additive and anti-multiplicative.
 - d. An expression is called anti-morphic if it is interpreted as an anti-morphism.

The definitions given in (39) implicitly assume that the relevant expressions the characterization of which we are concerned with take scope over conjoined or disjoined phrases. Let us now consider the sentences in (40)–(41).

- (40) John-hako Mary-ka oci anhassta.
 John-and Mary-NOM come did not
 a. ‘John did not come and Mary did not come.’
 b. ‘John did not come or Mary did not come.’
- (41) John-ina Mary-ka oci anhassta.
 John-or Mary-NOM come did not
 a. ‘John did not come or Mary did not come.’
 b. ‘John did not come and Mary did not come.’

Without an intonation break between *oci* and *anhassta*, (40) is interpreted as (40a), the reading where the coordinate NP *John-hako Mary* ‘John and Mary’ takes scope over the negation *anhassta*. The reading in (40b) is available only with the marked intonation. In contrast, (41) is not ambiguous. Even with a marked intonation pattern, (41) seems to lack the reading in (41b) where the negation takes scope over the coordinate NP *John-ina Mary* ‘John or Mary’. This fact strongly suggests that the negation could be interpreted as anti-multiplicative but not as anti-additive in Korean. The same fact obtains with the other expressions in (38).

Thus far I have shown that the class of expressions that license NPIs in Korean cannot be defined as anti-morphisms. This does not mean that there is no unified notion that properly characterize them. They are all monotone decreasing expressions in the sense to be defined below. This is borne out by the following fact:

- (42) a. $\llbracket \text{uymilonca 'a semanticist'} \rrbracket \leq \llbracket \text{enehakca 'a linguist'} \rrbracket$
 b. $\llbracket \text{Enehakca-ka oci anhassta 'No linguist came'} \rrbracket \leq \llbracket \text{Uymilonca-ka oci anhassta 'No semanticist came'} \rrbracket$
 c. $\llbracket \text{Enehakca-ka yeki-ey epsta 'No linguist is here'} \rrbracket \leq \llbracket \text{Uymilonca-ka yeki-ey epsta 'No semanticist is here'} \rrbracket$
 d. $\llbracket \text{John-i amwu enehakca-to molunta 'John doesn't know any linguist'} \rrbracket \leq \llbracket \text{John-i amwu uymilonca-to molunta 'John doesn't know any semanticist'} \rrbracket$

In the previous sections I argued that *amwu-to* is a universal quantifier that must take scope over their licensors. This means that expressions like *anhta* 'do not', *epsta* 'not exist', and *moluta* 'not know' should occur in the argument of the function denoted by *amwu-to*. Then there seems to be a conflict, since the standard definition of monotone decreasing (or monotonicity in general) in (28) requires those expressions to be functor expressions. In order to capture the fact we observed in (42), we should first carefully examine the definition in (28), repeated as (43).

- (43) a. Let (B, \leq) and (D, \leq) be partially ordered sets. Then a function f from (B, \leq) to (D, \leq) is monotone decreasing iff for all $x, y \in B$, $x \leq y \Rightarrow f(y) \leq f(x)$.
 b. An expression is called monotone decreasing if it is interpreted as a monotone decreasing function.

In mathematics, monotonicity has been assumed to apply to a function. This is because a function takes scope over its argument and because the relevant monotonicity inference is only possible when the item to be defined as to monotonicity takes wide scope. (44) illustrates the latter point.

- (44) a. John did not meet a semanticist.
 b. John did not meet a linguist.

As mentioned before, (44b) entails (44a). This is, however, a half of the story. Note first that the entailment in question is valid only when *not* is interpreted as taking wide scope over the object NPs. If it is interpreted as taking narrow scope, the entailment is reversed. Do all these basic facts guarantee that the so-called monotone decreasing expressions must be invariably functor expressions in natural languages, as stipulated in (43b)? Our discussion of the Korean data already suggests that they need not be

so. The definition in (43a) is essentially the same as Curry's (1963) definition in (45).

- (45) An expression Q is monotone decreasing with respect to the relation \leq if and only if $(\|X\| \leq \|Y\|) \Rightarrow (\|QY\| \leq \|QX\|)$

Here Q is originally assumed to be a functor expression, but it is possible to apply the definition in (45) to argument expressions. Let us, in principle, consider (46).

- (46) For all functions f and g , $f \leq g$ if and only if for all x , $f(x) \leq g(x)$

(46) is the standard definition of \leq on functions. Let $f(x) = 2(x)$ and $g(x) = 3(x)$, for all integers x . Then it is not the case that $f \leq g$, for all integers x . For example, $3(-2) \leq 2(-2)$. Rather, $f \leq g$, for all positive integers and zero, and $g \leq f$, for all negative integers. It is obvious that the definition in (46) is inadequate to capture the relation between the two functions f and g just described above. It seems that we should relativize the definition in (46) in such a way that it holds for only positive integers and zero. Let us call such arguments as positive integers and zero monotone increasing. Given that (46) is replaced by (47a), the inference schema in (47b) follows if x meets the definition of monotone decreasing in (45).

- (47) a. For all functions f and g , $f \leq g$ if and only if for all monotone increasing x , $f(x) \leq g(x)$
 b. For all functions f and g , $f \leq g \Rightarrow g(x) \leq f(x)$

What I have shown is that monotonicity can be defined for the argument of a function. This modification is fully compatible with a line of research tradition in Categorical Grammar that makes use of the flip-flop of function-argument structure. Furthermore, the definition in (45) can also apply to composite expressions.

Given that the class of expressions that may license *amwu-to* is defined to be monotone decreasing in the sense of (45), we are now able to formally state the relevant condition for *amwu-to*, as in (48).

- (48) The Licensing Condition for NPIs in Korean
 An NPI must be a functor expression that takes a monotone decreasing expression as an argument.

Postponing a full discussion of the effect of (48) to the next section, I'll

here give one illustrative example that shows how (48) is satisfied. As with English, I assume that *anhta* 'do not' is a polymorphic expression that maps an n -ary predicate to an n -ary predicate, and subject and object NPs are of type $S/(S\backslash NP)$ and $(S\backslash NP)\backslash((S\backslash NP)/NP)$, respectively. Consider (49).

(49)	John-i	amwuto	cohahaci	anhassta	
	<u>John</u>	<u>anyone</u>	<u>like</u>	<u>didn't</u>	
	$S/(S\backslash NP)$	$(S\backslash NP)\backslash((S\backslash NP)\backslash NP)$	$(S\backslash NP)\backslash NP$	$((S\backslash NP)\backslash NP)\backslash((S\backslash NP)\backslash NP)$	FA
			$(S\backslash NP)\backslash NP$		FA
			$S\backslash NP$		FA
			S		

Syntactically, the object *amwuto* takes the composite expression *cohahaci anhassta* 'didn't like', a monotone decreasing expression, as its argument in (49), conforming to the condition in (48). Semantically, *amwuto* denotes that LGQ EVERYONE from binary relations into properties which sends the complement of the LIKE relation to the set of objects in domain which do not bear the LIKE relation to any object in the PEOPLE set.

3.3. Some Empirical Advantages

The approach taken in this paper has some empirical advantages, and I would like to demonstrate this point in what follows.

As mentioned in the beginning of the paper, *amwu-to* can occur as subject in a simple sentence like (3b), repeated as (50).

(50)	Amwuto	ecey	oci	anhassta.
	anyone	yesterday	come	did not
	'No one came yesterday.'			

Sentence (50) would be assigned the derivation shown in (51).

(51)	<u>Amwuto</u>	<u>ecey</u>	<u>oci</u>	<u>anhassta</u>	
	$S/(S\backslash NP)$	$(S\backslash NP)/(S\backslash NP)$	$S\backslash NP$	FA	$(S\backslash NP)\backslash(S\backslash NP)$
		$S\backslash NP$			FA
		$S\backslash NP$			FA
		S			

In (51) the subject NP *amwuto* takes the composite expression *ecey oci*

anhassta 'didn't come yesterday' as argument, conforming to the condition in (48). It denotes that GQ function EVERYONE from properties into truth values, True or False, which sends a property q to 1 iff the property of being a person is a subset of q . So (51) is true iff $\text{PERSON} \subseteq \neg\text{COME}$.

The use of an NPI as subject in a sentence like (50) poses a problem for other approaches to NPIs and their licensing. Space limitations prevent me from discussing this point in detail, but I want to compare our analysis with Progovac's (1993). Generalizing A(argument)-binding to A'-binding, she proposes:

- (52) a. An NPI must be bound in its governing category.
 b. The governing category for X is the first maximal projection Y which contains X and its first potential antecedent.

The potential licensers in (52b) include local negation, superordinate negation, and Op (empty operator) in Comp. According to (52b), the governing category for *amwuto* in (50) is the whole clause. If 'bound' in (52a) is meant to be 'c-commanded and coindexed', sentence (50) is incorrectly predicted to be ruled out, since the negation *anhassta* 'did not' would fail to c-command *amwuto*.¹³

¹³ Here I assume the following definition of c-command:

- (i) α c-commands β iff neither of α and β dominates the other and every branching node that dominates α also dominates β .

An anonymous reviewer argues that if m-command in (ii) below, instead of c-command in (i), is relevant in Korean,

- (ii) α m-commands β iff neither of α and β dominates the other and every maximal projection that dominates α also dominates β .

the grammaticality of (50) can be explained by showing that *amwuto* is m-commanded by *anhassta*. It is not clear at all how this can happen. Furthermore, *amwuto* is licensed in the subject position even by the short form negation, as in (iii).

- (iii) Amwuto ecey an wassta.
 anyone yesterday not came
 'No one came yesterday.'

The negative formative *an* in (iii) is analyzed as a prefix to a verb or an adverb. It is entirely absurd to say that it m-commands *amwuto*. Thus, the grammaticality of (iii) is a more compelling example that shows that Progovac's account is not tenable.

Our approach deserves more merit. It gives a very natural account of the fact that NPIs have “strictly” local licensers in Korean, as exemplified by (4b), repeated as (53).

- (53) *John-un Mary-ka amwuto mannassta-ko sayngkakhaci anhassta.
 John-TOP Mary-NOM anyone meet-that think did not
 ‘John didn’t think that Mary met anyone.’

The derivation of sentence (53) would be like (54).

- (54) John-un Mary-ka amwuto mannassta -ko
 $S/(S\backslash NP)$ $S/(S\backslash NP)$ $(S\backslash NP)/((S\backslash NP)\backslash NP)$ $(S\backslash NP)\backslash NP$ FA $S'\backslash S$
 $*S\backslash NP$
sayngkakhaci anhassta
 $(S\backslash NP)\backslash S'$ $((S\backslash NP)\backslash S')\backslash((S\backslash NP)\backslash S')$

In (54) the embedded object NP *amwuto* takes the verb *mannassta* ‘met’ as argument, violating the licensing condition in (48). The only possible monotone decreasing expression that it could take as argument would be the composite ternary relation *mannassta-ko sayngkakhaci anhassta* ‘-didn’t think that _ met _’. As seen in (55), however, there is no way that this complex expression is composed. By Functional Application, one may combine *sayngkakhaci* ‘think’ with *anhassta* ‘didn’t’. By Functional Composition, one may further combine *sayngkakhaci anhassta* ‘- didn’t think -’ with *ko* ‘that’. At this point, however, derivation stops, since there is no way to combine *sayngkakhaci anhassta-ko* ‘- didn’t think that -’ with the verb *mannassta* ‘met’.

- (55) John-un Mary-ka amwuto
 $S/(S\backslash NP)$ $S/(S\backslash NP)$ $(S\backslash NP)/((S\backslash NP)\backslash NP)$
mannassta - ko sayngkakhaci anhassta
 $(S\backslash NP)\backslash NP$ $S'\backslash S$ $(S\backslash NP)\backslash S'$ $((S\backslash NP)\backslash S')\backslash((S\backslash NP)\backslash S')$ FA
 $(S\backslash NP)\backslash S'$ FC
 $(S\backslash NP)\backslash S$
 *X

Given the ungrammaticality of a sentence like (50), one may think that *amwuto* must have a clausemate negation. The example in (56) suggests that the relation between the NPI and its licenser is more local than the

with the fact that *amwuto*, which must take wide scope, cannot be embedded in another NP unless it has a licenser in that NP.¹⁴

4. Concluding Remarks

In this paper I discussed the differences in distribution and meaning between the English PS *any* and its Korean equivalent *amwu-to*. I argued that the former is an existential quantifier that must be in the scope of a monotone decreasing expression, but the latter, a universal quantifier that must take scope over a monotone decreasing expression. These characterizations led me to propose that the licensing condition for English NPIs should incorporate the locality requirement in the way that one can deal with the effect of intervention, but the licensing condition for Korean NPIs requires them to take as their argument a monotone decreasing expression that the grammar of Korean allows to be composed. The different formulations of NPI licensing have been shown to provide a natural explanation of why Korean NPIs are licensed by only a proper subset of monotone decreasing expressions, why an NPI is allowed to be a subject of a simplex sentence in Korean and why the relation between the NPI and its licenser in Korean is more local than the one in English.

In closing the paper, I would like to comment on some *apparent* counterexamples to our treatment. For one thing, one might argue that the class of expressions that license NPIs in Korean cannot be characteristically defined as monotone decreasing, since no monotone decreasing expressions except negation and some inherently negative verbs can license them, as in (2c-e),

¹⁴ An anonymous reviewer correctly pointed out that the ungrammaticality of (56) may be due to the morphological restriction that bars any *to*-phrases from being genitive-marked. The more general morphological restriction that comes into my mind is that no *to*-phrases can occur inside an NP unless they occur inside a relative clause or a complement clause. This restriction accounts for not only the ungrammaticality of (56) but also that of (i).

- (i) a. *John-to(-uy) chinkwu
 John-even-GEN friend
 ‘a friend of even John’
 b. *John-to-ey tayhan pipphan
 John-even-about criticis
 ‘the criticism of even John’

repeated as (60)-(62), respectively.

- (60) *Mary-ka noncayng-eyse amwuto pinanhan-tamyen, cil kes-ita.
 Mary-NOM debate-at anyone criticizes-if (she) lose will
 'If Mary criticizes anyone at the debate, she will lose.'
- (61) *Mary-ka amwuto pipnanhaki ceney, yeki-se naka-ca.
 Mary-NOM anyone criticize before here-from go out-let's
 'Before Mary criticizes anyone, let's get out of here.'
- (62) *Kikkeshayya sey myeng-uy haksayng-i amwuto pinanhayssta.
 at most three CL-GEN student-NOM anyone criticized
 'At most three students criticized anyone.'

The sentential connectives, *tamyen* 'if' in (60) and *ceney* 'before' in (61), and the quantified subject NP in (62) *kikkeshayya sey myeng-uy haksayng* 'at most three students' are clearly monotone decreasing expressions. Nonetheless, they cannot allow NPis. That an NPI is unacceptable in an *if*-clause or *before*-clause does not prove that our characterization of NPI licensing expressions is invalid. Rather, it gives further support to the whole approach taken here. Since such sentential connectives as "if" and "before" are binary relations between two propositions, it would be implausible to say that in sentences like (60)-(61), *amwuto* can take as argument a composite monotone decreasing expression that contains them.¹⁵ Hence there is no way that the licensing condition (48) can be met in (60) and (61). The ungrammaticality of (62) seems to pose a more challenging problem since a quantified NP like *kikkeshayya sey myeng-uy haksayng* 'at most three students' can be embedded in a larger expression, making it monotone decreasing. Careful study of the scope behavior of such quantified NPs, however, suggests a solution to the problem. Consider (63)-(64).

¹⁵ In formal semantics, "if" is interpreted as a (material) implication. According to Landman (1991), "before" is interpreted as follows:

(i) $\|p \text{ before } q\| = pBq(t_0)$
 $pBq(t_0)$ is True iff $\exists t_1 < t_0 [p(t_1) \wedge \forall t_2 [t_2 < t_0 \wedge q(t_2) \Rightarrow t_1 < t_2]]$
 ----- t_1 ----- t_2 ----- t_0 ----->
 $p(t_1)$ $q(t_2)$

- (63) Kikkeshayya sey myeng-uy haksayng-i motun chayk-ul ilkessta.
 at most three CL-GEN student-NOM all books-ACC read
 'At most three students read all books.'
- (64) Motun haksayng-i kikkeshayya sey kwen-uy chayk-ul ilkessta.
 all students-NOM at most three CL-GEN books-ACC read
 'All students read at most three books.'

Sentence (63) is unambiguous; it only means that the maximum number of students who read all books was three. That is, (63) has only the reading where *kikkeshayya sey myeng-uy haksayng* takes wide scope. Likewise, only the reading where *kikkeshayya sey kwen-uy chayk* 'at most three books' takes wide scope is available for (64). (64) lacks the reading that for each student *x*, *x* read at most three books.¹⁶ What the scope fact in (63) and (64) means is that an NP with the quantifier *kikkeshayya n CN* 'at most *n* CN' takes wide scope, irrespective of where it occurs in a sentence. If this is right, then we expect that such an NP could not cooccur with *amwu-to*, which is required to take wide scope by the licensing condition in (48), in the same clause. The expectation turns out to be the case, as the ungrammaticality of (62) shows.

The explanation given above, then, seems to enable us to reduce the differences in distribution between the English PS *any* and its Korean counterpart *amwu-to* to their different semantic values and other different aspects of the grammars of the two languages.

¹⁶ An anonymous reviewer claims that in a sentence like (i), the reading on which the subject NP *motun haksayng-i* is assigned wide scope is preferred to the reading on which the object NP *kikkeshayya chayk sey kwen-ul* is assigned wide scope.

- (i) Motun haksayng-i kikkeshayya chayk sey kwen-ul ilkessta.
 all students-NOM at most book three CL-ACC read
 'All students read at most three books.'

I disagree with the reviewer in the judgment. I don't still get the reading that s/he claims to be the more natural one in (i).

References

- Baker, C. L. (1970) 'Double Negatives,' *Linguistic Inquiry* 1:169-186.
- Barwise, J. and R. Cooper (1981) 'Generalized Quantifiers and Natural Languages,' *Linguistics and Philosophy* 4:159-219.
- Carlson, Greg N. (1980) 'Polarity *Any* is Existential,' *Linguistic Inquiry* 11: 799-804.
- Curry, H. B. (1963) *Foundations of Mathematical Semantics*, Reprint, Dover.
- Davison, Alice (1980) '*Any* as Universal or Existential?,' In *The Semantics of Determiners*, ed. Johan Van der Auwera, 11-40, London: Croom Heim.
- Dowty, David (1993) 'Monotonicity-based Logic and Why Natural Languages Have Negative Polarity and Negative Concord Marking,' Ms., Ohio State University.
- Fauconnier, Gile (1979) 'Implicational Reversal in Natural Language,' In *Formal Semantics for Natural Language*, ed. F. Guenther and S. J. Schmidt, 289-301. Dordrecht: Reidel.
- Heim, Irene (1984) 'A Note on Negative Polarity and Downward Entailingness,' In *Proceedings of NELS 14*, 98-107, GLSA, University of Massachusetts, Amherst.
- Higginbotham, James (1980) 'Pronouns and Bound Variables,' *Linguistic Inquiry* 11:679-708.
- Hoeksema, Jack (1986) 'Monotonicity Phenomena in Natural Language,' *Linguistic Analysis* 16:235-250.
- Hong, Minpyo (1995) *The Semantics and Pragmatics of Questions and Alternatives*, Doctoral dissertation, University of Texas, Austin.
- Horn, L. (1972) *On the Semantic Properties of Logical Operators in English*, Doctoral dissertation, University of California, Los Angeles.
- Jackendoff, Ray S. (1972) *Semantic Interpretation in Generative Grammar*. Cambridge, Mass. : MIT Press.
- Kadmon, Nirit and Fred Landman (1990) 'Polarity Sensitive *Any* and Free Choice *Any*,' In *Proceedings of the Seventh Amsterdam Colloquium, Part I*, ed. M. Stokhof and L. Torenvliet, 227-251, ITLI, Universiteit van Amsterdam.
- Kadmon, Nirit and Fred Landman (1993) '*Any*,' *Linguistics and Philosophy* 16:353-422.

- Keenan, Edward L. (1991) 'Natural Language and Generalized Quantifier Prefixes,' Ms., University of California, Los Angeles.
- Klima, Edward (1964) 'Negation in English,' In *The Structure of Language*, ed. Jerrold Fodor and J. Katz, 246-323, Englewood Cliffs, NJ: Prentice-Hall.
- Krifka, Manfred (1990) 'Polarity Phenomena and Alternative Semantics,' In *Proceedings of the Seventh Amsterdam Colloquium, Part I*, ed. M. Stokhof and L. Torenvliet, 277-301, ITLI, Universiteit van Amsterdam.
- Ladusaw, William (1979) 'Polarity Sensitivity as Inherent Scope Relations,' Doctoral dissertation, University of Texas, Austin.
- Ladusaw, William (1980) 'Affective *or*, Factive Verbs, and Negative-Polarity Items,' In *Papers from the Sixteenth Regional Meeting, Chicago Linguistic Society*, 170-184, Chicago Linguistic Society, University of Chicago, Chicago, Ill.
- Ladusaw, William (1983) 'Logical Form and Conditions on Grammaticality,' *Linguistics and Philosophy* 6:389-422.
- Landman, Fred (1991) *Structures for Semantics*, Dordrecht : Kluwer.
- Lasnik, Howard (1975) 'On the Semantics of Negation,' In *Contemporary Research in Philosophical Logic and Linguistic Semantics*, ed. Hockney et al., 279-311, Dordrecht : Reidel.
- Lee, Hyunoo (1993) 'Categories, Structures, and Principles of Anaphoric Dependencies,' Doctoral dissertation, University of California, Los Angeles.
- Lee, Young-Suk (1992) 'Licensing and Semantics of *any* Revisited,' In *Proceedings of NELS 23*, 287-301, GLSA, University of Massachusetts, Amherst.
- LeGrand, J. E. (1975) *Or and Any: the Semantics and Syntax of Two Logical Operators*, Doctoral dissertation, University of Chicago, Chicago, Ill.
- Linebarger, Marcia (1980) *The Grammar of Negative Polarity*, Doctoral dissertation, MIT, Cambridge, Mass.
- Linebarger, Marcia (1987) 'Negative Polarity and Grammatical Representation,' *Linguistics and Philosophy* 10:325-387.
- Milsark, Gary L. (1974) *Existential Sentences in English*, Doctoral dissertation, MIT, Cambridge, Mass.
- Nam, Seungho (1993) 'Another Type of Negative Polarity Item,' In *Dynamics, Polarity and Quantification*, ed. Makoto Kanazawa and Chris Pinõn,

- 3-15, CSLI, Stanford University, Stanford, Calif.
- Progovac, Ljiljana (1993) 'Negative Polarity : Entailment and Binding,' *Linguistics and Philosophy* 16:149-180.
- Quine, W. V. (1960) *Word and Object*, Cambridge, Mass.: MIT Press.
- Schmerling, Susan (1971) 'A Note on Negative Polarity,' *Papers in Linguistics* 4:200-206.
- Valencia, Vitor Sánchez (1991) *Studies on Natural Logic and Categorical Grammar*, Doctoral dissertation, University of Amsterdam.
- Vendler, Zenon (1967) 'Each and Every, Any and All,' In *Linguistics in Philosophy*. Ithaca, N. Y.: Cornell University Press.

Hyunoo Lee
Dept. of English Education
Inha University
Inchon 402-751
e-mail : hylee@dragon.inha.ac.kr