

“SPECIFIER-BINDING,” DONKEY ANAPHORA AND ENU..NA CONSTRUCTION IN KOREAN

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The so-called “donkey sentences” and what Reinhart (1987) called “Specifier Binding” constructions have been traditionally treated in totally different frameworks. In this paper, citing Korean data, we argue that these two types of constructions must be dealt with in the one and the same perspective. It will also be shown that our viewing them in one homogeneous perspective becomes possible when we adopt Haik’s Indirect Binding framework, which makes possible interesting comparisons between English and Korean donkey sentences. It will also be argued that in English “Specifier Binding” constructions, the spec-head agreement within the NP is important. The most important claim of this paper is that the scope facts must be included in discussing the semantics of donkey sentences and our extended Indirect Binding allows this. It will be stressed that the cross-linguistic variation between English and Korean donkey sentences also involved this scope facts.

1. Introduction

In this paper¹, I will discuss what implications the Korean *enu...na* construction would give to the theory of variable binding. The so-called Korean *enu...na* construction is exemplified in the following sentences.

- (1) [[*enu pihængki-uy*] thapsungkaek]-ina [*kukes-i*
ENU airplane-GEN passenger -NA it-NOM
ancenhake nal-a ka-ki]-lul pala-n-ta
safely fly go-COMP-ACC hope-IMPERF-DEC
‘Every airplane’s passenger hopes that it flies safely.’
- (2) [[*enu concacephum-ul sa-nun*] salam]-ina
ENU elec. device-ACC buy-PNE person-NA

¹This paper is a revised and abbreviated version of chapter 4 of my doctoral dissertation at MIT.

[*kukes-i olae ka-ki*]-lul huimangha-n-ta
 it-NOM long last-COMP-ACC hope-IMPERE-DEC
 '(Close English paraphrase) Every person who buys an electronic
 device hopes that it lasts a long time.'

In (1) and (2), we observe that the quantifier *enu pihangki* 'ENU airplane' and the quantifier *enu concacephum* 'ENU elec. device' do not c-command the pronoun *kukes* 'it'. However, the pronoun can function as a bound variable.² Note, on the other hand, that the element *-(i)na* is attached to the NPs that contain the quantifier *enu N'* and that these NPs with *-(i)na* c-command the pronoun *kukes*. We will return to a more detailed discussion of the properties of these *enu...na* constructions in section 2.

These are then instances of constructions in which the variable binding becomes possible without the antecedent quantifier c-commanding the pronoun. In fact, these constructions are variants of "Specifier Binding" (Reinhart (1987)'s term) and donkey sentences, much discussed in literature. An English "Specifier Binding" and donkey sentence are illustrated below:

- (3) *Every boy's* mother loves *him*.
 (4) Every man who owns *a donkey* beats *it*.³

We will call the type of construction in (3) a "Specifier Binding"(henceforth SB) construction and we adopt the term "donkey sentence" for the

²It was claimed by Sungshim Hong(1985), among others, that Korean pronouns cannot function as a bound variable. However, in M.Y.Kang(1988), I provided sufficient data to show that Korean pronouns *can* function as a bound variable. Some difference between Japanese pronoun *kare* and Korean *ku* was discussed from a historical perspective in my talk at Seoul National University on Apr. 21, 1989.

³The following type of sentences had also been called donkey sentences:

- (i) If a man owns a donkey, he beats it.
 (ii) If someone is in Athens, he is not in Rhodes.

However, Korean data do not present any interesting facts about this type of sentence. It is my view that this type of sentence is quite different in nature from donkey sentences involving relative clauses, even though the interpretations of both of these types of donkey sentences are parallel in some respects. Thus, when I say donkey sentences without qualification in the text, it will refer to the donkey sentences of the relative variety. For a good review of both of these kinds of donkey sentences, readers are referred to Heim(1982, 1987).

construction in (4).

Discussions on these constructions are proliferate in literature. To cite a few: Reinhart(1983a.b, 1987), May(1977, 1985), Weinberg & Hornstein (1986), Higginbotham(1980, 1983), Heim(1982, 1987), Cooper (1979), Parsons (1978), Partee(1978) and Haik(1984). In these discussions, one notable trend is that the phenomenon of SB and that of donkey sentences are believed to require separate types of solutions.⁴ However, as we note in the examples of (1) and (2), these two types of sentences require one and the same type of solution, as far as Korean is concerned. Thus, I will argue in this paper that a certain mechanism, called "Indirect Binding" devised by Haik(1984), will give us the possibility to view these two types of phenomena from one perspective.

We will also acknowledge that there is a certain semantic difference between the English type of donkey sentence in (4) and the Korean type in (2). We note also that Korean has another type of donkey sentence, which is exactly parallel to that of the English donkey sentence (4). This is illustrated below:

- (5) [[*concephem-ul sa-nun enu salam*]-*ina* [*kukes-i olae*
 elec. device-ACC buy-PNE ENU person-NA it-NOM long
ka-ki]-*lul huimangha-n-ta*
 last-COMP-ACC hope-IMPERF-DEC
 '(Close English paraphrase) Every person who buys an electronic
 device hopes that it lasts a long time.'

It is thus my view that there are two types of donkey sentences, one of which slightly differs from the other in semantics. We will return to a more detailed discussion in section 3.

Now we would naturally like to have a theory that can provide us with a basis for a comparison between these two types of donkey sentences. And I will argue in this paper that the "Indirect Binding" framework, with a slight extension, will precisely give us this basis.

2. Properties of *Enu...na* Construction

It is well known that Korean quantifying expressions analogous to

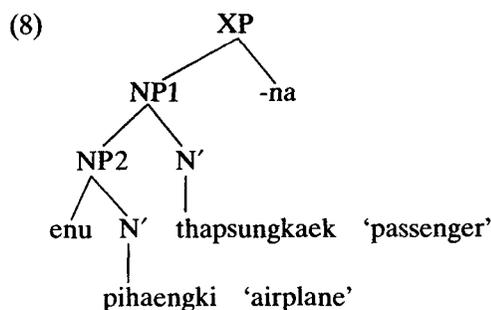
⁴There are some exceptions, however. May(1985) and Reinhart(1987) tried to view these two phenomena from the same perspective.

English *everyone* or *anyone* or to English *every N'* (like *every boy*) are composed of two parts. And these two parts can sometimes be discontinuous.^{5,6}

- (6) Nuku-na ka-ss-ta
 everyone go-PAST-DEC
- (7) Enu ae-na ka-ss-ta
 every boy go-PAST-DEC

In Korean, *nuku* or *enu N'* can be used either as a wh-expression like *who* or *which N'* or as an indefinite expression like *someone* or *some N'*. Now, if we want to obtain a universal quantifying expression, we attach *-na* to the wh/indefinite expression *nuku*, as in (6), or we attach *-na* to the NP of which *enu* 'which' is a specifier, as in (7). The example (7) is an instance in which the wh/indefinite expression *enu* and *-na* can be discontinuous.

This discontinuity is obvious in SB constructions and donkey sentences in (1) and (2). In (1), we have the following structure for the subject of this sentence:



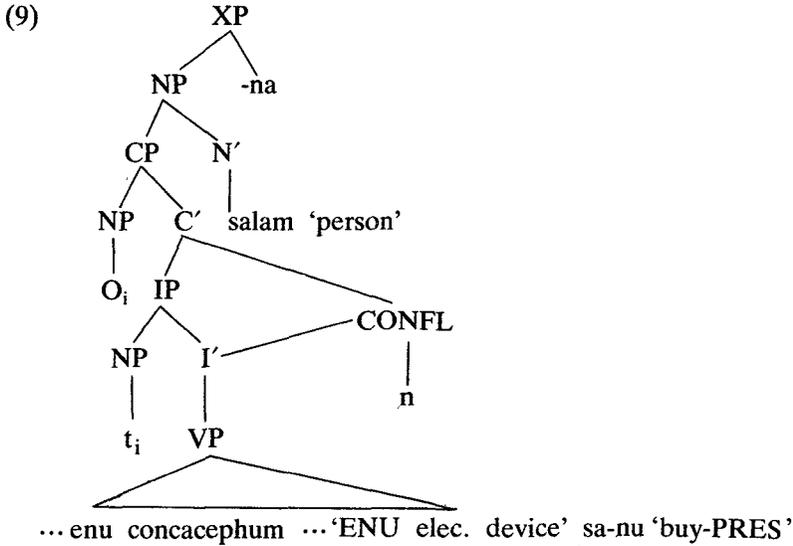
In (8), the particle *-na* is attached to the NP1, while *enu* is the specifier of NP2, which is again the specifier of NP1.

In (2), the subject NP of this sentence contains a relative clause. It will

⁵Korean universal quantifying element, represented as *enu* and *nuku* plus *-na*, has two readings in which they are either like *every* or like 'free choice' *any* in English.

⁶The particle *-na* has another variant, *-ina*. The question is what this *-i-* is. T.W.Han(personal communication) suggested that it must be a copula. If it must be viewed as a copula, the subjects in (6) and (7) of the text must actually be a part of a sentence. This then complicates the structures of sentences (6) and (7) considerably. In this paper, I avoid this complication, and assume that the particle *-(i)na* is attached simply to arguments. I will await a future study for the exact status of *-i-* in *-(i)na*.

have the following structure:^{7,8}



In (9), *enu* N' is within the relative clause and the particle *-na* is attached to the dominating NP.

It is obvious from the data (6) and (7) that the elements *nuku* or *enu* do not alone have the universal force. It is only when these elements combine with the particle *-na* that they obtain the universal force. In this sense, we can safely say that the element *-na* is the element that provides a universal force to the indefinite/wh-expression, or it functions as a "distributor" for the indefinite/wh-expression. The same account must be given to the constructions in (8) and (9), where the elements *nuku* or *enu* are substantially discontinuous from the particle *-na*.

Note also that the "universal" sense of the particle *-na* cannot be expressed without the co-occurring *enu* or *nuku*. In the following phrase, which lacks *enu/nuku*, the particle *-na* must mean either something like the disjunctive 'or' in English or 'in addition to...'

(10) ku salam-ina.....
the man-NA

⁷Following Nishigauchi(1986), we assume that the relative clause is a specifier of NP.

⁸I assume that the pronominal affixes *-n* or *-l* in Korean relative clauses are instances of CONFL, a merged form of COMP and INFL. See M.Y.Kang(1988).

So, it is clear that *enu/nuku* and *-na* are discontinuously dependent elements. Together, they have the force of universal quantification. But, when they are discontinuous, we may view them separately, as follows:

- (11) a. the elements *enu/nuku* mark the position to be quantified;
 b. the particle *-na* provides the universal force to the *nuku/enu N'*.

In addition, there is one more important property of *-na*, which is stated as follows:

- c. the particle *-na* indicates that *nuku/enu N'* has scope over the NP that is marked with *-na*.

This last statement requires some explanation. This property of *-na* becomes clear when we consider the donkey sentence like (2) in Korean. Consider the following sentence, which is like (2), but has the particle *-na* within the relative clause:

- (12) [[*enu concacephum-ina sa-nun*] *salam*]-*i*
 ENU elec. device-NA buy-PNE person-NOM
 [*kukes-i olae ka-ki*]-*lul* *huimangha-n-ta*
 it-NOM long last-COMP-ACC hope-IMPERF-DEC
 '(Close English paraphrase) Every person who buys an electronic device hopes that it lasts a long time.'

The pronoun *kukes* in the matrix sentence cannot function as a bound variable for *enu concacephum* 'ENU elec. device.' This is because the particle *-na* is within the relative clause and it is not attached to NP dominating the relative clause. This indicates that it is only when the particle *-na* is attached to the NP whose head is the head noun of the relative clause that the scope of the quantifier *enu concacephum* 'ENU elec. device' can be extended over the subject of the matrix sentence (2). Thus, we conclude that the particle *-na* indicates that the scope of the *enu N'* is over the NP marked with *-na*, as we did in (11c).

Note also that the N *thapsungkaek* 'passenger' in (1) is always understood to co-vary with the quantifier *enu pihaengki* 'ENU airplane.' That is, this N *thapsungkaek* 'passenger' is understood to be within the scope of *enu pihaengki* 'ENU airplane'. This means that, with the help of the particle *-na*, the scope of the quantifier *enu pihaengki* 'ENU airplane' can be extended over the subject NP in (1). This scope fact is clearly con-

nected to the fact that the pronoun *kukes* 'it' in (1) can function as a bound variable for *enu pihaengki* 'ENU airplane.'

3. Semantics of Korean Donkey Sentence

In this section, we will discuss certain aspects of Korean donkey sentences like (2). To understand this, it is necessary to discuss an important property of the English donkey sentence widely known in literature.

The English donkey sentence (4) earned its fame due to the fact that the indefinite a *donkey* has an "exhaustive," or universal, reading even though it is only an indefinite. Thus, sentence (4), repeated here:

(4) Every man who owns a *donkey* beats *it*.

implies that, if a person owns several donkeys, he is supposed to beat *all* of the donkeys. Thus, this reading is often represented by the following expression:

(13) for all x, for all y ((x is a person & y is a donkey & x owns y)(x beats y))

which is identical to:

(14) for all x, y((x is a person & y is a donkey & x owns y)(x beats y)).

Even though the representation in (14) is widely accepted for the sentence in (4), the representation (14) is not the correct representation of the meaning of (4), upon a closer inspection. What (14) says is that for all person-donkey pairs, if the former owns the latter, the former beats the latter. It must be observed, however, that sentence (4) is not the statement about the person-donkey pairs, but the statement about the donkey-owning people.

This distinction is slight, and in sentence (4) which involves the universal quantification, this distinction cannot be made in truth-conditional terms. However, as Heim(1987) discusses extensively, this distinction becomes truth-conditionally significant in the following type of the sentences:

(15) Most farmers who own a donkey are rich.

Suppose that there are 100 farmers in the universe and that 99 of them own exactly one donkey and are poor, while one of them owns 200 donkeys and is rich. If the sentence (15) is about the farmer-donkey pairs, this sentence is supposed to be true, since there are 299 farmer-donkey pairs in the universe and 200 of such pairs involve the rich farmer. However, sentence (15) is clearly false in this situation.⁹ What (15) actually means is that most of the donkey-owning farmers are rich.

As Heim(1987) briefly indicated, this fact may be a problem for the semantic theories that represent the meaning of (4) as (14), but it is not a problem when we consider the surface scope relations between the quantifier *every man* and the indefinite *a donkey*. In English donkey sentence (4), the quantifier *every farmer* has a scope over the indefinite *a donkey*. Hence, the correct 'asymmetric' reading is predicted. We now see that for the correct interpretation of donkey sentence, syntactic scope relations are important.¹⁰

This fact was also illustrated by Rooth(1986)(who was cited by Heim(1987)). He suggested that the following two sentences are not judged to be fully equivalent:

(4) Every man who owns a donkey beats it.

(16) Every donkey which is owned by a man is beaten by him.

Presented with a situation where one man owns 10 donkeys and beats 9 of them while every other man beats every donkey he owns, informants often hesitate to judge (4) false, but they readily reject (16) under such interpretation. This state of affairs can be viewed as natural when we consider the scope relations between the quantifiers: In (4), the quantifier *every man* has wide scope; but in (16), the quantifier *every donkey* has wide scope.

Now let us return to Korean donkey sentence like (2). In (2), it is the

⁹This problem is called "farmer-donkey asymmetries" or the "proportion problem." This problem was extensively discussed in Heim(1987), who notes that Rooth(1986), Kadmon(1987) and Roberts(1987), among others, also discussed this problem.

¹⁰There is of course a question of how we represent these scope relations in semantics, This question, however, is beyond the scope of this paper. Thus, leaving it for future work, we will remain vague as to the precise semantic representation of these scope relations, just stressing that these scope relations are important.

N' *concephem* 'elec. device' that is universally quantified, not the relative head N' *salam* 'person.' However, the sentence (2) is similar to English donkey sentence in that the head noun *salam* in (2) has also an "exhaustive" implication. Thus, the sentence (2) implies that, if there are 6 people who bought an electronic device, then *all* of them must hope that it last a long time. Thus, we might represent the meaning of Korean donkey sentence (2) as follows, given the universal reading of both of *concephem* 'elec. device' and *salam* 'person.':

- (17) for all x, y((x is a person & y is a elec. device & x buys y)(x hopes that y lasts long)).

In this representation, the fact that the universal quantifier is at the N' *concephem* 'elec. device' within the relative clause in Korean donkey sentence has no consequence in semantics.

However, upon a closer inspection, the representation of (17) does not fully represent the correct meaning of the sentence (2). The Korean sentence (2) is a statement about the electronic devices people buy, rather than the elec. device-person pairs. In other words, in (2), the quantifier element *enu concephem* 'ENU elec. device' has a scope over the N' *salam* 'person.' The sentence (2) must then be interpreted in a manner in which the English passive donkey sentence (16) is interpreted.

Recall our discussion that in English donkey sentence like (4), the *man* has a wider scope over the *donkey*. In Korean donkey sentence, the interpretation is just to the opposite. This state of affairs is now viewed as quite natural: In Korean, the universal quantification is at the N' *concephem* 'elec. device' and it can have wider scope; while in English the universal quantification is at the N' *person*, hence it has wider scope.

At this juncture, we may turn our attention to the question of how the quantifier *enu concephem* 'ENU elec. device,' which is embedded within the relative clause, can have scope over the relative head *salam* 'person.' Note that, in English, the following sentence does not have the interpretation in which the pronoun is a bound variable for *every donkey*.

- (18) A/Every person who owns *every donkey* beats *it*.

The reason that in Korean donkey sentence (2), the scope of *enu concephem* 'ENU elec. device' can be extended over the NP dominating the relative clause is precisely that the particle *-na* is present at the NP. Recall that, if the particle is not present at the relevant NP, the variable binding

was impossible (refer to (12)).

As we discussed in the last section, the particle *-na* has the *inherent* capability that makes *enu* N' or *nuku* to have scope over the NP that *-na* is attached to. In English, which lacks such a particle, the variable binding of the matrix pronoun *it* by *every donkey* in (18) is thus impossible.

In this section, we have seen that Korean donkey sentence (2) and English donkey sentence (3) differ with respect to scope facts, and that this difference became possible mainly due to the presence of the particle *-na* in Korean.

4. Semantics of SB Construction

In section 1, we claimed that Korean data suggest that the SB and donkey sentence must be viewed in the same perspective. In this section, we discuss some semantics of the SB construction, which will support our claim.

Note that SB constructions have a similar interpretation to that of donkey sentences. Consider the sentence (1). This sentence has the reading that the N' *thapsugkaek* 'passenger' is exhaustively understood. That is, this sentence implies that, if an airplane has 290 passengers, *all* of the 290 passengers of the airplane hope that the airplane flies safely.¹¹ This reading is predicted by our analysis, in which we have argued that the donkey and SB constructions are basically in the same format.

As Howard Lasnik (p.c.) and Reinhart(1987) suggested, this reading is

¹¹Note also that, if the *enu* quantifier is followed by several N's, all of these successive N's are understood to be exhaustive. Observe the following sentence:

- (i) Hankook-e-nun [[[enu toshi]-uy kongcang-uy] pyek]-ina ppalkahke
 Korean-LOC-TOP ENU city-GEN factory-gen Wall-NA red
 chilha-e ci-e iss-ta
 be-painted

'In Korean, every city's factory's wall is painted red.'

This sentence implies that every wall of every factory of each city is painted red. Its meaning can be represented as follows:

- (i) (For all x, x a city,) (for all y, y x's factory) and (for all z, z y's wall), z is painted red.

also implied in the analogous English sentence. For example, in the following sentence:

- (19) Every commuter’s vehicle must be inspected before entering the free way.

this sentence implies that, if a commuter has 3 vehicles, all of them must be inspected before entering the free way. That is, this sentence has the reading:

- (20) (For all x , x a commuter,) (for all y , y x ’s vehicle,) y must be inspected before entering the free way.

However, this representation is not quite precise, when we take the scope fact into account. Sentence (19) is a statement about a commuter owning vehicles, not about the commuter-vehicle pairs.

5. Haïk(1984)’s Indirect Binding

Summarizing our discussion thus far, we have following two main facts:

- (21) (i) the particle *-na* makes the *nuku* or *enu* N' to have scope over the NP that *-na* is attached to.
 (ii) With the help of this particle, differing scope facts between English and Korean donkey sentence obtain.

In this section, we will show that these two related facts can be adequately captured when we assume and extend Haïk’s “Indirect Binding” framework. We shall see that Haïk’s Indirect Binding framework will provide us with an important syntactic device that will represent the fact (i) and it will give us a syntactic basis upon which the comparison between English and Korean donkey sentences can be successfully made.

Haïk’s major concern is to spell out the exact *syntactic* condition on donkey sentences that involve the relative clause.¹² In order to solve the problems involving the donkey sentences of the relative variety, Haïk first

¹²However, her concern is not limited to donkey sentences. She argues that her Indirect Binding can be extended to Crossing Coreference sentences, etc.

introduced a mechanism called “Scope Indexing.” This notion is based on her assumption that the pronouns must be c-commanded by the quantifier at S-structure in order for them to be interpreted as bound variables (except for the case of indirect binding, as we will discuss later). By “Scope Indexing,” rather than by QR, she tried to capture scope relations between quantifiers.¹³ She proposes that, when a quantifier A is in the scope of another quantifier B, both of the quantifiers A and B are marked in certain ways that indicate this scope relation. In particular, she argues that when a quantifier A is within the scope of another quantifier B, the quantifier A with the narrow scope will be marked by the index of the quantifier B with the slash (/) – i.e. the quantifier with narrow scope will be marked by the slash index, whose number is identical to the wide scope quantifier. On the other hand, the wide scope quantifier will also be marked by the “parenthesis” index, whose number is identical to the narrow scope quantifier. She states the following conventions:

(22) *Scope Indexing*

a. *Slash Indexing*

If NP_i is to be interpreted as in the scope of NP_j , then append $/j$ to the index of NP_i ; that is, a structure containing $NP_{i/j}$ is unambiguously interpreted with NP_i as in the scope of NP_j . i/j is a referential index.

b. “Parenthesis” Indexing

$NP_i \rightarrow NP_{i(j)}$ iff NP_i has scope over NP_j

According to these conventions, the following sentence:

(23) Two men love a woman.

will have the following indexing, if the indefinite a woman is understood to be within the scope of two men:

(24) Two men_{*i(j)*} love a woman_{*j/i*}.

In (24), the first index of two men, i.e. i , is the inherent index of the NP two men; its second index, i.e. the parenthesis index (j), is the scope

¹³The approach here is basically to try to represent the scope relations by marking the NPs involved, rather than by moving these NPs to certain positions. Similar approaches have been taken by Lasnik(1972), Kroch(1974) and Williams(1986).

index, which marks the fact that some NP with the index j is within its scope. Similarly, the indefinite NP *a woman* has two indices: the first index j is its inherent index; the second index, i.e. the slash index i , marks the fact that this NP is within the scope of the NP with the index of i .

Assuming these conventions, let us return to donkey sentences. As we have discussed, Haïk notes that there is a condition in the donkey sentences of the relative clause type that the NP that contains the indefinite *a donkey*, i.e. the NP whose head is *everyone* in English, must c-command the pronoun, even though this NP is not the direct binder of the pronoun. Note that the following sentences are all ungrammatical:

- (25) a. *Everyone who owns *a donkey* came, and Mary bought *it*.
- b. *Shouting at [some people who owned *a donkey*] frightened *it*.
- c. *Mary kissed [two men who had bought *a donkey*] because she found *it* cute.

These sentences are ungrammatical because the NP that contains the indefinite *a donkey* phrase (i.e. *Everyone who owns a donkey* in (a), *some people who owned a donkey* in (b) and *two men who had bought a donkey* in (c)) does not c-command the pronoun *it* at S-structure in each sentence. From this fact, she argues that there must be some binding relationship between the NP that contains the relative clause (in which the indefinite *a donkey* is embedded) and the pronoun.

Note that this binding relationship cannot be binding in its normal sense, since subject NPs in the donkey sentences do not share an index with the pronoun. The pronoun is rather co-indexed with the indefinite *a donkey* which is embedded within the relative clause, which is, in turn, contained by the subject NP.

As is clear now, this binding relationship *can* be established if we assume the scope indexing conventions we discussed above, even though this binding may not be a "direct" one.

Given the scope indexing conventions, the donkey sentences with the relative clause will be represented as follows:

- (26) [NP₁₍₂₎ every man [who [_s t₁₍₂₎ owns
 [NP_{2/1} a donkey]]]] beats it_{2/1}.

Thus, the idea is that, if we allow a certain type of scopally marked indices, i.e. parenthesis indices in particular, to bind the pronouns, we can

establish a binding relationship between the subject NP in (26) and the pronoun. She calls such a binding relationship Indirect Binding. In order to allow this Indirect Binding, she reformulates the condition on variables, such that:

(27) *Condition on Variables*

- a. Pro_i must be c-commanded by NP_i , if NP_i is an inherent quantifier.
- b. $\text{Pro}_{i/j}$ must be c-commanded either by $\text{NP}_{i/j}$ or by $\text{NP}_{j(i)}$ (Indirect Binding).

This is the gist of Haik's Indirect Binding.

As was mentioned in section 2, *enu/nuku...na* are discontinuously dependent elements: They, as a whole, signify the universal quantification and, in this reading, neither of them is dispensable.

I would like to assume that these two elements are inherently co-indexed – this co-indexing being morphologically determined. Further, I suggest that *-na* signals the *slash* co-index (in the sense of Haik), rather than simple co-index.

More precisely, suppose that there is an NP that is marked with *-na* and that it dominates either the NP *nuku* or *enu N'*. In this situation, let us call the NP that is marked with *-na* a *container NP*; And call the NP that is marked by *nuku* or *enu* an *Enu/nuku NP*. Now, we assume the following convention:

(28) *Enu/nuku...na Indexing Convention*¹⁴

If *i* is the index of the container NP and *j* is the index of the *Enu/nuku* NP, then append */j* to the index of the container NP.

By this convention, the container NP will have the index *i/j* and it is obligatorily understood as being under the scope of the *Enu/nuku* NP. Given (28), the fact (i) of (21) is adequately captured.

To see how this convention works, let us cite the following simple example:

¹⁴We might also consider the possibility of marking the *Enu/nuku* NP with the parenthesis index of the container NP. But I don't pursue it here. It may be that this marking is optional – i.e. mark it if necessary.

- (29) *enu haksæng-ina ku-uy sukce-lul kkuthnae-ss-ta*
 ENU student-NA he-GEN homework-ACC finish-PAST-DEC
 ‘Every student finished his homework.’

In (29), the container NP is also the *Enu/nuku* NP. Thus the subject NP is indexed as [*enu haksæng*]-*ina*_{1/1}, and this is equivalent to the simple index *I*.

In the SB construction, the subject NP will be indexed as follows by the convention in (30):

- (30) [[*enu pihaengki-uy*] thapsungkaek]-*ina*_{2/1} [*kukes*₁ -i
 ENU airplane-GEN passenger-NA it-NOM
 ancenhake nal-a ka-ki]-lul pala-n-ta
 safely fly go-COMP-ACC hope-IMPERF-DEC
 ‘Every airplane’s passenger hopes that it flies safely.’

Given this indexing, it is clear how we can make the subject NP with the slash index of the quantifier *enu pihaengki* ‘ENU airplane’ to indirectly bind the pronoun *kukes* ‘it.’ Recall that Haik allows only the parenthesis scope index to indirectly bind the pronoun.

Consequently, in Haik’s framework as is, it is not possible to have an indirect binding relationship in (30). Thus, we generalize her approach slightly, to the effect that the slash scope index can also (indirectly) bind the pronoun. This revision does not cost anything, and does not impose any change in the discussion of Haik(1984). Rather, it acquires more generality, since we are now claiming that *any* scopal index, not just a parenthesis index, can indirectly bind the pronoun. This, as far as I can see, is an improvement of the overall Indirect Binding framework.

Before we state this generalized version of the Indirect Binding, there is one thing that needs to be mentioned in this connection.

Recall that, in (27), Haik seems to require that, in order for a pronoun to be indirectly bound, it must also be slash indexed. But, this is actually not a requirement of any kind. The reason that she marked the pronoun with the slash index is simply because, in English, the indefinite ‘a donkey’ is within the scope of the wide scope quantifier *every man* and the pronoun just copied the index of the indefinite *a donkey*. In order to accommodate Korean data, then, we must leave the second index of the pronoun unspecified: This, however, would not necessitate any change in her arguments in the paper.

Given these revisions, we restate the conditions on variable in (27) as follows:

(31) *Condition on Variables (Generalized Version)*

- a. Pro_i must be c-commanded by NP_i , if NP_i is an inherent quantifier.
- b. $\text{Pro}_{i,*}$ must be c-commanded either by $\text{NP}_{i,*}$ or by any scopally co-indexed NP (i.e. either $\text{NP}_{j/i}$ or $\text{NP}_{j(i)}$) (Indirect Binding).

The star(*) in the index of the pronoun and the NP indicates that the second index of the pronoun, if it is present at all, is unspecified.

With this generalized condition on variables, we can now include the SB constructions in (30) as an instance of indirect binding.

Now consider Korean donkey sentence. Given our indexing convention in (31), the Korean donkey sentence (2) would have the following annotation of indices:

- (32) [[t *enu cenacephum*₁-lul sanu-n] salam]-*ina*_{2/1}
 ENU elec. device-ACC buy-PNE person-NA
 [kukes₁ -i olae ka-ki]-lul huimangha-n-ta
 it-NOM long last-COMP-ACC hope-IMPERF-DEC
 '(Close English paraphrase) Every person who buys an electronic device hopes that it lasts a long time.'

Applying the generalized condition on variables, this donkey sentence shows a clear instance of indirect binding.

In section 3, we noted that the Korean donkey sentence (2) has a reading in which it is a statement about the donkeys owned by people — neither about the person-donkey pairs nor about the donkey-owning people. This intuition is correctly captured in (32), where the slash index on the subject NP signifies that the quantifier *enu cenacephum* 'ENU elec. device' has scope over the N *salam* 'person.'

This state of affairs in Korean is in contrast to the English donkey sentence (4), where it is a statement about donkey-owning people. This interpretation is predicted by our analysis, since the English donkey sentence (4) has the parenthesis, not slash index, on the NP whose head is *man*, as we see in the example (26).

In this way, we can make an elegant comparison between English donkey sentences like (4) and Korean donkey sentences like (2): Both are instances of indirect binding, but, in English, it involves the parenthesis scope index, while, in Korean, it involves the slash scope index. This sort of comparison is only possible due to the scope indexing mechanism and to the idea of Indirect Binding.

In addition, the comparison between two types of donkey sentences((2) and (5)) can be made in the same manner. The sentence (5) would have the following indices:

- (33) [[*concephum*₁ -ul sa-nun] *enu salam*]-ina_{2/2(1)}
 elec. device-ACC buy-PNE ENU person-NA
 [*kukes*₁ -i olae ka-ki]-lul huimangha-n-ta
 it-NOM long last-COMP-ACC hope-IMPERF-DEC
 '(Close English paraphrase) Every person who buys an electronic device hopes that it lasts a long time.'

This representation is exactly the same as that of English donkey sentence. Hence, given the extended version of Haik's Indirect Binding, we can capture variations of Korean donkey sentences elegantly.

In this section, we have shown that the facts (i) and (ii) can successfully accounted for by slightly extending Haik's Indirect Binding.

6. Epilogue

Before concluding this paper, we'd like to discuss the following two points. (i) We have mentioned that the indefinites in the donkey sentences typically have an "exhaustive" reading. Can we explore some possible explanation for this fact? (ii) We argued that the SB is an instance of Indirect Binding. In Korean, this fact is very obviously seen. However, can we maintain the same for the English SB constructions?

As for (i), we will speculate the following solution, in the spirit of Heim(1982) and Nishigauchi(1986): We have said in section 2 that the *enu* N' is a *wh* element or an element like some N' and that the particle *-na* can be thought of as a provider of the universal force to the *enu* N'. But, we might speculate that this particle *-na*, functioning as a kind of unselective binder in the sense of Heim(1982), may also provide the universal force to other indefinite elements within the NP, in a similar manner in which it provides the universal force to the *enu* N'. In some sense, then, the indefinite NPs other than the *enu* N' may acquire the universal force *parasitically* from the particle *-na*. We may speculate this, even though we do not adopt the Heim and Nishigauchi's assumption that the *enu* N' and other indefinites that acquire parasitic universal force are actually variables bound the unselective binder.

As for (ii), we would like to suggest that the indirect binding in English SB constructions is facilitated by the fact that there is an agreement between the spec and head, which is universally available. Thus, in (4), the specifier *everyone* and the head *mother* may be co-indexed and, since the head is understood to be within the scope of *everyone*, this index may be translated as a slash index. This slash index percolates up to the dominating NP, so that we have the following annotation of indices:

(34) [[Everyone]₁'s mother]_{2/1} loves him₁.

This is an instance of generalized indirect binding. Note that, in the following sentence, where the universal quantifier is embedded within the relative clause:

(35) *A/Every person who owns *every donkey* beats *it*.

there is no analogous process of spec-head agreement between the universal quantifier *every donkey* and the relative head *a/every person*. Hence, in English, which lacks a scope element like *-na*, indirect binding is impossible in this structure.

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