Middle Constructions and Distributivity[*]

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Previously, various approaches dealt with middle constructions with insightful observations. However, none of them could address the fundamental property of middle constructions represented by the notion of recursiveness which can further be translated into plurality. Focusing on this semantic property of middle constructions, this paper claims that middle constructions can be viewed as constructions of distributivity. In proposing so, this paper divides middle constructions into three classes and shows that each class can be analyzed by the same pluralization operator that explains constructions of distributivity. One of the advantages of this paper is to explain why an adverb is, most of the time, necessary in forming middle constructions. The adverb functions as the Distributed Share, which is one of the essential arguments of distributivity. Another advantage is to account for why the middle constructions often evoke the modality interpretation by the fact that the pluralization operator comes with a Cover variable.

Keywords: Middle, Sorting Key, Distributed Share, plurality, distributivity

1. Introduction

This paper claims that middle constructions can be classified into three groups. The first group has a plural subject and an adverb while the second group has a grammatically singular subject and an adverb. The third group can have either a singular subject or a plural subject but is characterized as not having an overt adverb.

(1) a. Little children amuse easily.
    b. This metal anneals easily.
    c. This pen scratches.

In making a new classification on middle constructions, I claim that we can apply the analysis of distributivity to the three classes of middle constructions in a unified way. The first group is the default case of middle constructions since it has three essential components of distributivity. The second group lacks a plural subject but I argue that we can get a token plural reading out of the singular subject. For the third group, it seems that there is nothing to be distributed over. Yet, I argue that we can provide a covert adverb *really*, which expresses the unexpectedness meaning of middle constructions.

This paper is organized as follows. First, section 2 examines a previous study on middle constructions which argues for the recursiveness condition. Section 3 makes a new proposal on middle constructions. In doing so, section 3 is divided into three sub-sections. The first sub-section discusses the general theory of distributivity. The second sub-section claims that we need to classify middle constructions into three groups. The last sub-section provides a compositional analysis for each group of the middle constructions. Finally, section 4 concludes this paper.

2. Recursiveness

Previously, numerous studies examined middle constructions. Many syntactic approaches such as Keyser and Roeper (1984, 1992), Roberts (1987), and Carrier and Randall (1992) proposed various constraints on middle constructions. Also a number of studies such as Fagan's works (1988, 1992) and Tenny's works (1987, 1992, 1994) looked into the connection of the grammaticality of middle constructions with the aspectual properties of the verbs. Yet, Y-M Sohn (2002, 2003) pointed out that these studies encounter not a few counter-examples. Also, there have been many attempts that viewed middle constructions as causative constructions

such as Chung (1995a, 1995b, 1996, 2001) but it seems that there is little ground for believing that there is enough force that can be a causer in middle constructions.

Even though most of them made insightful observations and provided explanations on middle constructions despite some problems, discussing all of them in this paper would be impossible due to space restrictions. Thus, in this section, I would like to introduce one previous study, M-O Lee (2001), which is the most relevant to the main proposal of this paper.

M-O Lee (2001) argues for a recursiveness condition for middle constructions. According to this condition, middle sentences require 'the repetition of a regular action between the subject and the predicate.' For example, the (b) sentences in (2) and (3) are not acceptable while the (b) sentence in (4) is felicitous. According to M-O Lee (2001), the different judgments on grammaticality can be explained by whether or not the event involved can take place repeatedly or not.

(2) a. One can see Eiffel tower easily from my window.
    b.*Eiffel tower sees easily from my window.

(3) a. One can construct the sixty-three Building easily.
    b. *The sixty-three Building constructs easily.

(4) a. One can assemble this Lego easily.
    b. This Lego set assembles easily.

M-O Lee (2001) does not provide the recursiveness condition as the only condition for middles but she claims that this serves as one of the conditions that licenses middle constructions. As supporting evidence for the recursiveness condition for middles, M-O Lee (2001) provides examples below where middles are natural with the phrase *every time*.

(5) a. That car drives easily.
    b. That car drives easily every time we try.

(6) a. I find that Easter eggs sell well
    b. I find that Easter eggs sell well every time anyone tries.

(7) a. That knife cuts well.
    b. That knife cuts well every time anyone tries.

(8) a. My new steel-tipped boots kick well
    b. My new steel-tipped boots kick well every time I try.

M-O Lee (2001) considers two types of subjects that allow recursiveness. For the sentences in (9), the recursive reading comes from the generic subjects. Yet, for the sentences in (10), the subjects do not have a generic reading but M-O Lee (2001) claims that the sentences have a recursive event of photographing and cutting, respectively.

(9) a. Bureaucrats bribe easily.
    b. Eggs mix well with cream.

(10) a. Mary photographs well.
     b. This knife cuts well.

M-O Lee (2001) further argues that the recursiveness condition can explain why creation verbs cannot occur in middle constructions as shown in (11). The reason is simple: the creation verbs cannot imply recursiveness.

(11) a. *A new job creates easily.
     b. *A good car won't produce easily.
     c. *The Golden Gate Bridge builds easily.

M-O Lee (2001) has an explanation on a possibly problematic example in (12). In the middle construction in (12), it is not easy to get the recursiveness sense at first glance. However, she claims that this sentence necessarily involves with 'numerous books with the same title, the same cover, and so on.' To phrase her claim differently, we can infer that the sentence

in (12) necessarily involves each token of the book and hence encodes plurality.

(12) This book sells well.

M-O Lee (2001) also notes that the reason why middle constructions are usually used with the present tense is because of the recursiveness condition. The present tense expresses the time span where repetitive actions can occur. Yet, she further mentions that, when the repetition is not implied in spite of the present tense, the middle sentences cannot be formed as shown in (13).

(13) a. Jane does her homework now.
        (*Her homework does for Jane.)
    b. I try veal for the first time in my life.
        (*Veal tries for the first time in my life for me.)

She further notes that the middle construction is possible with tenses other than the present tense as long as the recursiveness condition is satisfied.

(14) a. One could extend the tripod easily.
    b. The tripod used to extend easily. (Fellbaum, 1986)

(15) a. People could wash out red wine spots easily in the past.
    b. Red wine spots used to wash out easily. (Fellbaum, 1986)

(16) a. Your oven will clean in minutes!
    b. This apple sauce will digest rapidly.
    c. Unwise bureaucrats will bribe easily for anyone. (Stroik, 1999)

In this section, I have discussed various aspects of the recursiveness condition on middle constructions that M-O Lee (2001) proposed. The recursiveness condition can be understood as plurality involved with middle constructions since the necessity of repetition means there must be plural

entities or events involved in middle constructions. This plurality sense perceived with respect to middle constructions naturally leads us to analyze them as constructions of distributivity since, as Landman (2000) claims, distributivity is reduced to plurality.

3. Proposal

This section has three sub-parts. In the first sub-section, I will introduce a theory of distributivity that explains when we perceive distributivity. The second sub-section will classify middle constructions into three groups to analyze them under the theory of distributivity. The last sub-section will propose a compositional analysis of middle constructions as constructions of distributivity.

3.1. Distributivity

Capturing the essence of distributivity as a relation between a semantically plural argument and an indefinite argument within a clause boundary, J-W Choe (1987) analyzes the distributive interpretation of the following data in a unified way. Set 1 has overt distributivity markers such as *each* in English and *ssik* in Korean while Set 2 has a dependent plural which also functions as a distributivity particle. Furthermore, J-W Choe (1987) claims that such data in Set 3 with no overt particles that evoke distributivity can generate distributivity in the same way as the data in Set 1 and Set 2.

(17) Set 1
　　　a. Each child made a hat.
　　　b. The children made a hat each.
　　　c. They made a hat each.
　　　d. Ai-tul-i phwungsen-hana-ssik-ul sa-ess-ta. [Korean]
　　　　　Child-PL-Nom balloon-one-Acc buy-Pst-Dec
　　　　　'The children bought a balloon each.'

     e. Vier Männer hoben je drei Tische. [German]
       Four men lifted three tables.
       'Four men lifted three tables each.'

     f. Ja dal mal'čikam po jabloku. [Polish and Russian]
       I gave boys (masc dat pl) apple (neut dat sg)
       'I gave the boys an apple each.'

(18) Set 2
     a. Unicycles have wheels.
     b. Automobiles have headlights

(19) Set 3
     a. Every child made a hat.
     b. The children made a hat.
     c. They made a hat.

The generalization that we can make regarding the sentences above can be summarized as follows. First, a semantically plural distributive antecedent must be present. Second, all the sentences above have an indefinite argument distributed over each distributive antecedent. Third, the semantically plural distributive antecedent must be in the same sentence with the indefinite argument in a certain relation.

In observing the generalization concerning the seemingly unrelated sentences in the above, J-W Choe (1987) puts forth a new theory of distributivity. According to this theory, distributivity is derived merely if certain conditions are met. The two conditions concerns two co-arguments. The semantically plural distributive antecedent is called a Sorting Key while the indefinite argument is termed a Distributed Share. The conditions on them are illustrated as follows:

(20) Sorting Key (Srtky) is <u>semantically plural</u>.
     English determiner 'each,' Korean 'kak-' and '-mata'⋯

(21) Distributed Share (Dstrshr) is <u>indefinite</u>.
    Korean 'ssik' German 'je' Polish and Russian 'po' and post
    nominal 'each'···

The occurrence of distributivity can be explained on the systematic and
predictable bases. The reading of distributivity is absent in the examples
in (22) since the condition on Sorting Key is not satisfied. That is, there
is no semantically plural argument. On the other hand, the reason why
the distributive reading is absent in (23) lies in the fact that the sentences
lack an indefinite argument, disobeying the condition on the Distributed
Share.

(22) a. Somebody made a red hat.
    b. Mia chose a blue tie.
    c. A gentleman was following a fugitive.

(23) a. Everybody is afraid of Medusa.
    b. They elected Bill for the post.

The sentences above are grammatical even though they do not satisfy
the conditions of distributivity since there is no overt marking of
distributivity. However, the situation is different when an overt distrib-
utivity marker is present. When a distributive particle such as *each* occurs
in a sentence and either of the conditions for distributivity is not satisfied,
the sentence becomes ungrammatical as below.

(24) a. *Fido is afraid of a person each.
    b. *Somebody is afraid of a person each.
    c. *Two interpreters each were assigned to the visitor.

J-W Choe (1987) defines his theory of distributivity as in (25a) and explains
it as in (25b). According to him, when distributivity is evoked under
circumstances that satisfy the conditions of distributivity, the ∀∃-structure
arises and the atomic parts of the semantically plural distributive ante-

cedent distribute over the denotation of the indefinite argument.

(25) a. Dstr (A, B) = ∀(a*A)a∃B(R(a,B))
       The i-parts of the denotation of A distribute over the denota-
       tion of B.
   b. If distributivity from *A* to *B* is evoked as Dstr (A, B), it first
      introduces a universal quantifier for *a,* which is an atomic
      part of *A*, and then replaces the variable *A* with *a.* At the
      next step, the distributivity dependency induces an existential
      quantifier for *B* to the right side of the universal quantifier.

In sum, for the projection of distributivity, we simply need three things:
a semantically plural Sorting Key, an indefinite Distributed Share and
the two elements being bound in a certain relation within a clause. As
long as these simple conditions are satisfied, we can receive a distributive
interpretation.

3.2. Three Classes of Middles[1]

In the previous section, we have learned that distributivity is evoked
if there are three elements: a plural Sorting Key (henceforth, SrtKy) and
an indefinite Distributed Share (henceforth, DstrShr) and a clause-bound
relation that connects the two arguments. To claim that middle con-
structions meet the conditions of distributivity, we need to classify middles
into three groups.

Group 1 is the most obvious case where distributivity can be sensed
most directly. I would like to claim that the middles with a plural subject
and an adverb is the default cases. In the examples listed in (26), we
can commonly receive the interpretation each of the entities denoted by
the subject is in a certain relation with respect to a certain aspect delineated
by the adverb. In these examples, the plural subject serves as the SrtKy
and the adverbial functions as the DstrShr. The relation is manifested
by the main verb.

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1) The data discussed in this section are from Y-M Sohn (2002).

(26) Group 1: Middles with a Plural Subject
    a. Little children amuse easily.
    b. Idaho potatoes bake beautifully.
    c. Copper rods bend easily.
    d. Crystal vases break easily.
    e. Tomatoes bruise easily.
    f. Wool rugs clean well.
    g. Example sentences construct with difficulty.
    h. His actions contrast with his promise.
    i. Cotton clothes dry easily.
    j. Children's toys assemble with difficulty.
    k. Cheap basketballs dribble poorly.
    l. These apples cook well.
    m. Mistakes erase poorly.

Yet, the majority of middle constructions have the form of the middles belonging to group 2 and the surface structure does not look like it can project distributivity. Yet, if we examine the underlying meaning, in these cases too, we can get the distributivity interpretation, even though the subject in the following examples is grammatically singular. As discussed in the previous section, distributivity requires a plural SrtKy. Yet, as M-O Lee (2001) observes, we can find a recursiveness condition for middle constructions which can boil down to plurality in essence. Thus, I would like to claim that we draw the "each token" reading out of the singular subject when it comes to middle constructions. In other words, the interpretation of (27a) is "each token of this metal anneals easily."

(27) Group 2: Middles with a Singular Subject
    a. This metal anneals easily.
    b. Newsprint binds easily.
    c. Bubble gum chews more softly.
    d. Dark paint covers poorly.
    e. This cup does not crush easily.
    f. This coat buttons easily.

     g. This train connects with the express train.

     h. Stale bread cuts easily.

     i. Aluminum dents more easily than steel.

     j. This material drapes like silk.

     k. This skirt fastens on the side.

     l. Love feeds on jealousy.

     m. Glass grinds smooth.

     n. This dress hooks at the front.

     o. This fabric launders nicely.

     p. This door opens easily.

The next group of middles has the structure which seems to lack the DstrShr. Most of middle constructions require an adverb but not all of them. I would like to claim that the middles in (28) are possible since we can have the implicit DstrShr that can be represented by the adverb *really*. Thus, in the following examples, the aspect of being really is distributed over each token or entity of the subject in a certain relation. For instance, in (28b), we get the interpretation that each figure will not add really, while, in (28c) we receive the interpretation that each token of his belt wouldn't buckle really.

  (28) Group 3: Middles without an Adverb

     a. Riches tend to accumulate.

     b. The figures will not add.

     c. His belt wouldn't buckle.

     d. This pen scratches.

     e. The door will not shut.

This idea of having the default adverb *really* when there is no overt adverb in middle constructions is from Y-M Sohn (2002) who claims that the examples in (29) implicitly evoke the meaning of *really* even though it is not overtly present. This claim is further supported by M-C Cho (2002) who argues that the underlying meaning of middle constructions is unexpectedness.

(29) a. Bureaucrats BRIBE.
    b. The bread DOES cut.

Accoridng to M-C Cho (2002), the middle construction is licensed without an adverb only when the sense of unexpectedness can be perceived. The sentence in (30a) is acceptable without an overt adverb since the default adverb *really* fits into the contextual meaning of the sentence. There are dresses which do not button. However, the sentence in (30b) is un-acceptable without an adverb since ordinarily all the books are read.

(30) a. This dress buttons.
    b. *This book reads.

For the middle constructions that can stand without an adverb, we have inserted the implicit adverb *really*. Yet, in terms of M-C Cho (2002), I would like to note that what determines the insertion possibility of the adverb *really* is the sense of unexpectedness residing in the middle construction rather than the possibility of inserting the adverb itself. Only when we can have the sense of unexpectedness, we can provide a covert DstrShr *really*. Thus, the example like (30b) cannot take the covert DstrShr *really* although the insertion might be possible in ordinary English.

3.3. Analysis

This section will present compositional analyses of the three groups of middle constructions discussed in the previous section. These analyses will be based on Y-K Joh (2008, 2011). On the basis of J-W Choe (1987), Landman (2000) and Zimmermann (2002), Y-K Joh (2011) has proposed a pluralization operator in (31) with a Cover variable. In the denotation defined in (31), the logical type of the variables Z and P is $<\alpha,t>$. The variable Z is the plural set while the variable P is the atomic set. The relation-denoting variable R is defined as the semantic type $<e,<\alpha,t>>$. The variable R basically incorporates intransitives, transitives, and ditransitives. In cases of intransitives such as the predicates in middle

constructions, the variable R has the type $<e,<v,t>>$.

(31) $[[*_{ij}]] = \lambda P_{<a,t>}. \forall z[z_{<a>} \in Z_{iCov<a,t>} \rightarrow \exists x_{<a>}[P(x) \; \& \; R_{j<e,<a,t>>}(x)(z)]]$

In the denotation, there are three variables which reflect the three integral components of distributivity as follows.

(32) a. The variable Z represents the distributive antecedent (SrtKy).
b. The variable P represents the Distributed Share (DstrShr).
c. The variable R represents the primary relation between the SrtKy and the DstrShr.

Crucially, the operator in (31) is evoked not only by an overt distributivity marker but also by an implicit distributive particle. Thus, even for the sentences without an overt distributivity marker, the operator can be evoked and generate the distributivity interpretation as long as the conditions for distributivity are met. Last but not least, the pluralization operator in (31) has the Cover variable which sorts out the contextual information. What this means is that, when the Cover is filled with an ill-fitting value, the distributive reading can allow for exceptional cases, reducing the universal quantificational force.

The type $<a>$ above captures the structural parallelism between the nominal domain and the verbal domain in the respect that it can be either type $<e>$ or type $<v>$. This liberated type mechanism is in order since we will allow the indefinite argument to be an eventive adverbial just like the Korean example below.

(32) Haksayng-tul-i ppalli-tul wa-ss-ta.
　　　Student-IPM quickly-EPM come-Pst-Dec.
　　　'The students came quickly.'
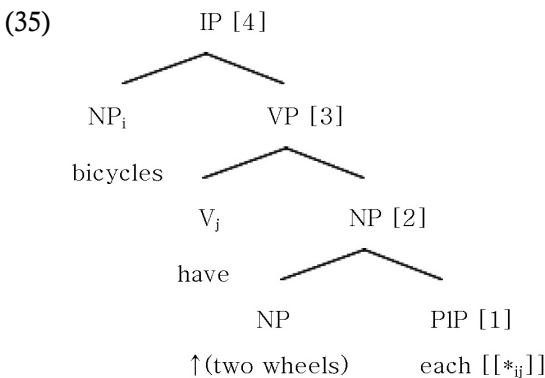
In addition to the pluralization operator in (31), Joh (2008) adopts Bittner's (1994) λ-abstraction rule in (33) for compositionality. The reason why Bittner's rule is employed instead of a more standard rule is that the

distributivity to be explained is the distance-distributivity.

(33) Let α have a translation [[α]] and let the index 'i' be the index
of either α or a sister of α, and let [[α]] contain a variable u
with index 'i.' Then λu$_i$.[[α]] is a translation of α.

Equipped with the devices above, developing Zimmermann (2002), Y-K
Joh (2008) illustrates how the distributivity sense of the sentence in (34)
can be generated. First, the distributivity marker *each* induces the plural-
ization operator that first applies to the DstrShr. Yet, the DstrShr *two
wheels* in (35) should be remedied before the pluralization operator applies
to it since the DstrShr is plural in itself. Since the operator in (31) is
a pluralization operator, it cannot apply to a plural element itself. By
definition, a pluralization operator is unable to pluralize an already plural
object. Thus, when the DstrShr is apparently plural, a group-forming oper-
ation must take place first to shift it into an atomic group. Then the
lambda-abstraction rule defined above enables the variable *R* to be the
next candidate of function application and to be filled with the co-indexed
relation-denoting main verb *have*. Finally, the lambda-abstraction rule
above takes place again to factor in the SrtKy variable *Z*, which is filled
with the value of the plural noun phrase *bicycles*.

(34) Bicycles have two wheels each.

(35)   IP [4]
              _____/_____
           NP$_i$ VP [3]
                           _____/_____
         bicycles   V$_j$ NP [2]
                                      _____/_____
                       have   NP   PIP [1]
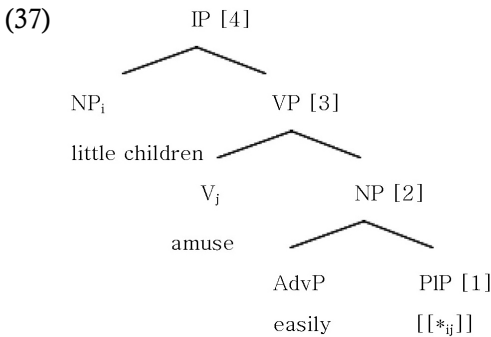   ↑(two wheels)   each [[*$_{ij}$]]

$[[1]] = \lambda P. \forall z[z \in Z_{iCov} \rightarrow \exists x[P(x) \ \& \ R_j \ (x)(z)]]$

$[[2]] = \forall z[z \in Z_{iCov} \rightarrow \exists x[\uparrow(\text{two wheels}) \ (x) \ \& \ R_j \ (x)(z)]]$

<Function Application>

$[[2]] = \lambda R_j. \forall z[z \in Z_{iCov} \rightarrow \exists x[\uparrow(\text{two wheels}) \ (x) \ \& \ R_j \ (x)(z)]]$

<λ-abstraction>

$[[3]] = \forall z[z \in Z_{iCov} \rightarrow \exists x[\uparrow(\text{two wheels}) \ (x) \ \& \ \text{have} \ (z, x)]]$

<Function Application>

$[[3]] = \lambda Z_i. \forall z[z \in Z_{iCov} \rightarrow \exists x[\uparrow(\text{two wheels}) \ (x) \ \& \ \text{have} \ (z, x)]]$

<λ-abstraction>

$[[4]] = \forall z[z \in [[\text{bicycles}]]_{Cov} \rightarrow \exists x[\uparrow(\text{two wheels})(x) \ \& \ \text{have} \ (z, x)]]$

<Function Application>

First, we can apply the simple mechanism for distributivity illustrated above to the middle construction belonging to Group 1. The plural subject serves as the SrtKy and the adverbial functions as the DstrShr. The value of the variable R is filled with the main verb. This is the default case of the middle construction since the sentence itself comprises three essential components of distributivity the most naturally.

(36) Little children amuse easily.

(37)

```
                    IP [4]
              /           \
        NP_i              VP [3]
    little children     /        \
                      V_j          NP [2]
                    amuse        /        \
                              AdvP          PlP [1]
                              easily        [[*_ij]]
```

$[[1]] = \lambda P. \forall z[z \in Z_{iCov} \rightarrow \exists x[P(x) \ \& \ R_j \ (x)(z)]]$

$[[2]] = \forall z[z \in Z_{iCov} \rightarrow \exists x[\text{easily} \ (x) \ \& \ R_j \ (x)(z)]]$

<Function Application>

$[[2]] = \lambda R_j. \forall z[z \in Z_{iCov} \rightarrow \exists x[\text{easily} \ (x) \ \& \ R_j \ (x)(z)]]$

<λ-abstraction>

$[[3]] = \forall z[z \in Z_{iCov} \rightarrow \exists x[\text{easily} \ (x) \ \& \ \text{amuse} \ (z, x)]]$

<Function Application>
[[3]] = $\lambda Z_i. \forall z[z \in Z_{iCov} \rightarrow \exists x[easily\ (x)\ \&\ amuse\ (z,\ x)]]$
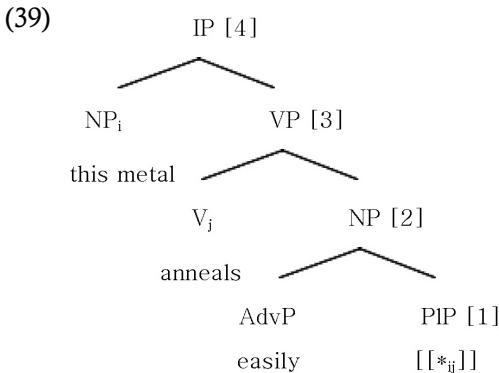<λ-abstraction>
[[4]] = $\forall z[z \in [[little\ children]]_{Cov} \rightarrow \exists x[easily\ (x)\ \&\ amuse\ (z,\ x)]]$
<Function Application>

For the middle constructions with a grammatically singular subject, we need to make one small change. We do not extract an atomic entity out of the plural SrtKy but we do extract each token out of a singular SrtKy. The operation $\in_{token}$ in the semantic derivation illustrated in (39) is responsible for this token-extracting operation out of the grammatically singular but semantically plural SrtKy. Other than that, the same mechanism applied to the middle constructions with a plural subject can explain cases such as (38).

(38) This metal anneals easily.

(39)

```
                        IP [4]
                   ╱            ╲
              NP_i              VP [3]
           this metal        ╱        ╲
                          V_j          NP [2]
                        anneals      ╱        ╲
                                 AdvP          PIP [1]
                                 easily        [[*_ij]]
```

[[1]] = $\lambda P. \forall z[z \in Z_{iCov} \rightarrow \exists x[P(x)\ \&\ R_j\ (x)(z)]]$
[[2]] = $\forall z[z \in Z_{iCov} \rightarrow \exists x[easily\ (x)\ \&\ R_j\ (x)(z)]]$
<Function Application>
[[2]] = $\lambda R_j. \forall z[z \in Z_{iCov} \rightarrow \exists x[easily\ (x)\ \&\ R_j\ (x)(z)]]$
<λ-abstraction>
[[3]] = $\forall z[z \in Z_{iCov} \rightarrow \exists x[easily\ (x)\ \&\ anneals\ (z,\ x)]]$
<Function Application>
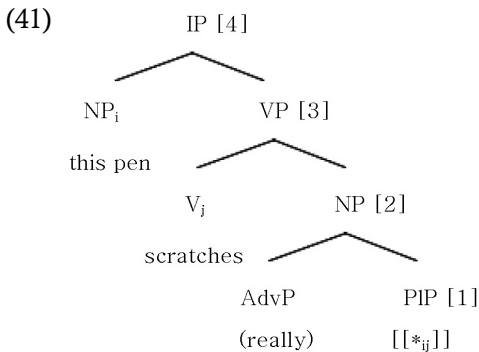[[3]] = $\lambda Z_i. \forall z[z \in Z_{iCov} \rightarrow \exists x[easily\ (x)\ \&\ anneals\ (z,\ x)]]$

<λ-abstraction>
[[4]] = $\forall z[z \in_{token}$ [[this metal]]$_{Cov} \rightarrow \exists x[easily (x) \& anneals (z, x)]]$
<Function Application>

For the middle construction belonging to Group 3 such as (40), we can present the analysis in (41). Nothing particular is going on, compared to the previous analyses for other groups of middles. The only change made is that the DstrShr *really* is covertly evoked on the basis of the sense of unexpectedness.

(40) This pen scratches (really).

(41)

```
              IP [4]
           ╱        ╲
        NP_i        VP [3]
      this pen    ╱      ╲
               V_j       NP [2]
            scratches  ╱      ╲
                    AdvP      PlP [1]
                   (really)   [[*_ij]]
```

[[1]] = $\lambda P. \forall z[z \in Z_{iCov} \rightarrow \exists x[P(x) \& R_j (x)(z)]]$
[[2]] = $\forall z[z \in Z_{iCov} \rightarrow \exists x[really (x) \& R_j (x)(z)]]$
<Function Application>
[[2]] = $\lambda R_j. \forall z[z \in Z_{iCov} \rightarrow \exists x[really (x) \& R_j (x)(z)]]$
<λ-abstraction>
[[3]] = $\forall z[z \in Z_{iCov} \rightarrow \exists x[really (x) \& scratches (z, x)]]$
<Function Application>
[[3]] = $\lambda Z_i. \forall z[z \in Z_{iCov} \rightarrow \exists x[really (x) \& scratches (z, x)]]$
<λ-abstraction>
[[4]] = $\forall z[z \in_{token}$ [[this pen]]$_{Cov} \rightarrow \exists x[really (x) \& scratches (z, x)]]$
<Function Application>

At this point, let me have some remarks on a characteristic of middle constructions. With the examples in (42) and (43), Y-M Sohn (2003) dis-

cusses the modality property of middles while Fagan (1992) describes
the same reading as a capacity reading of middles with the examples
in (44) and (45). In my opinion, the more accurate term is the modality
reading of the middle construction, not the capacity reading, since the
following examples do not necessarily tell us the capacity of the door,
the wood or the book. Yet, as they commonly observe, middle con-
structions are often added with the meaning of the auxiliary *can*. I argue
that this reading is originated from the Cover variable accompanied by
the pluralization operator above. The variable allows an ill-fitting cover
to lessen the strength of the sentence, embracing some exceptional cases,
and thus the modality reading can be perceived.

(42) a. This wood splits easily.
     b. This wood can be split easily.

(43) a. This door opens easily.
     b. This door can be opened easily.

(44) a. This book reads easily.
     b. This book can be read easily.

(45) a. This caddy adjusts from 6 feet to 8 feet...
     b. This caddy can be adjusted from 6 feet to 8 feet...

Carlson and Pelletier (1995) sense the genericity reading out of English
middle constructions. Yet, I would like to explain the genericity reading
in the same line as the modality reading. Both genericity and modality
readings suggest that somehow the plural reading in middle constructions
has the reduced universal quantificational force. In my analysis, the reduc-
tion can be explained by the Cover variable accompanied by the plural-
ization operator since the Cover variable can be filled with an ill-fitting
cover that allows exceptions that reduce the universal quantificational
force.

Lastly, let me discuss the biggest advantage of this paper. The analysis

of this paper can explain the reason why middle constructions require adverbs most of the time even though adverbs are usually considered as adjuncts. The reason is simple under my analysis: the adverb must be present since it is one of the core arguments that projects distributivity. The distributivity interpretation can be complete when there is an indefinite argument and in middle constructions an overt adverb or a covert adverb expressing unexpectedness must serve as an indefinite argument. The argument-like characteristic of the adverb in middle constructions has been the fact that previous studies could not explain properly. Yet, the current study addresses it most naturally by capturing the fact that middles are constructions of distributivity. In middle constructions, an overt adverb or an implicit adverb of unexpectedness is necessary as one of the co-arguments for distributivity.

4. Conclusion

This paper has proposed a new perspective on middle constructions, claiming that middle constructions can be viewed as distributivity constructions. As J-W Choe (1987) claims, distributivity is a construction that is projected as long as a semantically plural argument and an indefinite argument are in the same sentence under a certain relation. I claim that middle constructions can satisfy these conditions.

In arguing so, this paper needed to classify middle constructions into three groups. The middle construction with a plural subject and an adverb is the default case while the middle construction with a singular subject and an adverb is the extended case of the middle construction even though the latter case constitutes the majority of middle constructions. Especially, for the second group of middle constructions, this paper has claimed that we can extract a token reading out of a grammatically singular but semantically plural subject. The middle construction without an overt adverb inserts the default adverb *really*, under the condition that the construction expresses unexpectedness.

This claim can naturally explain why most middle constructions require

adverbial modification. The adverb in middles functions as the DstrShr which is the essential component of distributivity. The middle construction can occur without an adverb only when the context provides an implicit adverb *really* under the notion of unexpectedness. This paper has also explained why middle constructions often have the modality interpretation or the genericity interpretation by the fact that the pluralization operator that evokes distributivity carries a Cover variable which can lessen the strength of the universal quantificational force that the operator induces.

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