

Distributivity in an Event Semantics*

Sei-Rang Oh
University of Connecticut

1. Introduction: Distributivity Marker *ssik*

In Korean, the particle *ssik* has a property of marking distributivity. *Ssik* usually occurs with a numeral-classifier sequence within a noun phrase, as in (1):

- (1) John-kwa Mary-ka kabang sey-kay-ssik-ul wunpanha-ess-ta
John-and Mary-Nom suitcase three-Cl-Dist-Acc carry-Past-Dec¹
lit. 'John and Mary carried three suitcases-Dist'

In (1), *ssik* appears following a numeral-classifier sequence (*sey-kay*) in the direct object position. The sentence has the following interpretation as the salient one:

- (2) John and Mary each carried three suitcases.
 $\forall x \in [\text{John and Mary}]: x \text{ carried three suitcases}$
($[\text{John and Mary}] = \{\text{John, Mary}\}$)

Here I assume conjoined proper names as well as plural noun phrases denote sets of individuals. In (2), *John and Mary* denotes a set which has two members, John and Mary. So the interpretation given in (2) is: for every member x of the set *John and Mary* denotes, x carried three suitcases.

Another possible interpretation for (1) is the following:

- (3) John and Mary together carried suitcases three at a time (more than 1 time)
 $\exists e. \forall e' \in e: \text{John and Mary together carried three suitcases in } e'$

Here e represents an event, and e' a sub-event. I assume an event can be plural when it contains several sub-events (Krifka 1992, Lasnik 1995, Landman 1996, 1997, Brisson 1998, among others). So the interpretation in (3) is paraphrased as 'there is an event e and for every sub-event e' of the event e , John and Mary together carried three suitcases in the sub-event e' '.

Given the interpretations in (2) and (3), sentences with *ssik* contrast with those without *ssik* in that the ones with *ssik* are characterized as necessarily having a distributive reading, and the distribution can be over individuals (as in (2)) or events (as in (3)). Consider (4), which is without *ssik*:

- (4) John-kwa Mary-ka kabang sey-kay-lul wunpanha-ess-ta
John-and Mary-Nom suitcase three-Cl-Acc carry-Past-Dec
lit. 'John and Mary carried three suitcases.'

In contrast to (1), (4) has one interpretation as the salient one, which is 'John and

Mary together carried three suitcases'²; the distributive reading in (2) is marginal and the reading in (3) is impossible to get. Like this, whereas a sentence without *ssik* doesn't necessarily have a distributive interpretation, a sentence containing *ssik* is always forced to have a distributive interpretation.

Then how can we explain this distributive interpretation which *ssik* causes? How does it cause two distributive interpretations in one sentence, as we have seen in (2) and (3)? In this paper, having these questions in mind, I am going to spell out the semantics of the distributivity marker *ssik*. Specifically, I am going to give an analysis of compositional interpretation of *ssik* construction (Let me refer to sentences containing *ssik* as *ssik*-construction from here). In section 2, I will investigate the properties of *ssik*-construction in detail. In section 3, I will discuss previous analyses of *ssik*-construction and point out their shortcomings. Then I will provide my own analysis, deriving the interpretations of *ssik*-construction compositionally. In section 4, more phenomena regarding *ssik* will be discussed as supporting evidences for the proposed analysis. Finally, conclusions and theoretical implications will be given in section 5.

2. The Data and the Properties of *Ssik*

Let's first consider where *ssik* appears in a sentence. Basically, the distributivity marker *-ssik* can appear in a subject position as well as an object position, or in both positions. (5) shows examples of *ssik* in subject positions³:

- (5) a. saram twu-myeng-*ssik*-i kabang sey-kay-lul wunpanha-ess-ta
man two-Cl-Dist-Nom suitcase three-Cl-Acc carry-Past-Dec
lit. 'Two men-Dist carried three suitcases'
- b. hyengsa twu-myeng-*ssik*-i yongyuija twu-myeng-ul manna-ess-ta
detective two-Cl-Dist-Nom suspect two-Cl-Acc meet-Past-Dec
lit. 'Two detectives-Dist met two suspects'

And in (6), *ssik* is present in object positions:

- (6) a. saram twu-myeng-i kabang sey-kay-*ssik*-ul wunpanha-ess-ta
man two-Cl-Nom suitcase three-Cl-Dist-Acc carry-Past-Dec
lit. 'Two men carried three suitcases-Dist'
- b. aitul-i pwungsun twu-kay-*ssik*-ul sa-ess-ta
children-Nom balloon two-Cl-Dist-Acc buy-Past-Dec
lit. 'Children bought two balloons-Dist.'

Sentences in (7) have *ssik* both in subject and object positions:

- (7) a. saram twu-myeng-*ssik*-i kabang sey-kay-*ssik*-ul wunpanha-ess-ta
man two-Cl-Dist-Nom suitcase three-Cl-Dist-Acc carry-Past-Dec
lit. 'Two men-Dist carried three suitcases-Dist'
- b. haksang twu-myeng-*ssik*-i nonmun han-pyun-*ssik*-ul palpyoha-ess-ta
student two-Cl-Dist-Nom paper one-Cl-Dist-Acc present-Past-Dec

lit. 'Two students-Dist presented one paper-Dist'

Now let us consider what kind of NPs can host *ssik*. We have seen above that numeral NPs can host *ssik*. As seen in the following examples, *ssik* is not allowed in an NP without numerals:

- (8) a. saram twu-myeng-***ssik***-i kabang sey-kay-lul wunpanha-ess-ta (=5a)
man two-Cl-Dist-Nom suitcase three-Cl-Acc carry-Past-Dec
lit. 'Two men-Dist carried three suitcases'
b. *saram-***ssik***-i kabang sey-kay-lul wunpanha-ess-ta
man-Dist-Nom suitcase three-Cl-Acc carry-Past-Dec
- (9) a. saram twu-myeng-i kabang sey-kay-***ssik***-ul wunpanha-ess-ta (=6a)
man two-Cl-Nom suitcase three-Cl-Dist-Acc carry-Past-Dec
lit. 'Two men carried three suitcases-Dist'
b. *saram twu-myeng-i kabang-***ssik***-ul wunpanha-ess-ta
man two-Cl-Nom suitcase-Dist-Acc carry-Past-Dec

The only difference between (8a) and (8b) is that the numeral is omitted from the NP containing *ssik*⁴, and the same for (9a) and (9b). And both (8b) and (9b) are ungrammatical. Without numerals, the sentences do not get better even though we replace the singular nouns with plural nouns, as in (10):

- (10) a. *saram-tul-***ssik***-i kabang sey-kay-lul wunpanha-ess-ta
man-Pl-Dist-Nom suitcase three-Cl-Acc carry-Past-Dec
b. *saram twu-myeng-i kabang-tul-***ssik***-ul wunpanha-ess-ta
man two-Cl-Nom suitcase-Pl-Dist-Acc carry-Past-Dec

The sentences in (10) are both ungrammatical. Proper names also make the sentences ungrammatical, since they do not involve any numerals:

- (11) a. *kyoswu twu-myeng-i John-kwa Mary-***ssik***-ul manna-ess-ta
professor two-Cl-Nom John-and Mary-Dist-Acc meet-Past-Dec
lit. 'Two professors met John and Mary-Dist'
b. *kyoswu twu-myeng-i Mary-***ssik***-ul manna-ess-ta
professor two-Cl-Nom Mary-Dist-Acc meet-Past-Dec
lit. 'two professors met Mary-Dist'

Given this, we can say that only numeral NPs can host *ssik*.⁵ Now let us consider whether there is any kind of requirement for other NPs in *ssik*-construction.

- (12) a. kyoswu twu-myeng-i haksang twu-myeng-***ssik***-ul manna-ess-ta
professor two-Cl-Nom student two-Cl-Dist-Acc meet-Past-Dec
lit. 'Two professors met two students-Dist.'
b. kyoswu-tul-i haksang twu-myeng-***ssik***-ul manna-ess-ta
professor-Pl-Nom student two-Cl-Dist-Acc meet-Past-Dec

- lit. ‘Professors met two students-Dist.’
- c. ku kyoswu-ka haksang twu-myeng-*ssik*-ul manna-ess-ta
the professor-Nom student two-Cl-Dist-Acc meet-Past-Dec
lit. ‘The professor met two students-Dist.’
- d. John-kwa Mary-ka haksang twu-myeng-*ssik*-ul manna-ess-ta
John-and Mary-Nom student two-Cl-Dist-Acc meet-Past-Dec
lit. ‘John and Mary met two students-Dist.’
- e. John-i haksang twu-myeng-*ssik*-ul manna-ess-ta
John-Nom student two-Cl-Dist-Acc meet-Past-Dec
lit. ‘John met two students-Dist.’

All of these sentences are the same except the NPs in their subject positions. The sentences have *ssik* in the object positions. Given that the sentences are all grammatical, we can say that numerals (in 12a), plurals (in 12b), singular NPs (in 12c), conjoined proper names (in 12d), and singular proper names (in 12e) are all allowed as an argument in *ssik*-construction.

Now let’s see what interpretation(s) a sentence containing *ssik* has. Let me repeat the examples (5a),(6a), and (7a) below, so that we can easily compare.

- (13) a. saram twu-myeng-*ssik*-i kabang sey-kay-lul wunpanha-ess-ta(=5a)
man two-Cl-Dist-Nom suitcase three-Cl-Acc carry-Past-Dec
lit. ‘Two men-Dist carried three suitcases’
- b. saram twu-myeng-i kabang sey-kay-*ssik*-ul wunpanha-ess-ta (=6a)
man two-Cl-Nom suitcase three-Cl-Dist-Acc carry-Past-Dec
lit. ‘Two men carried three suitcases-Dist’
- c. saram twu-myeng-*ssik*-i kabang sey-kay-*ssik*-ul wunpanha-ess-ta (=7a)
man two-Cl-Dist-Nom suitcase three-Cl-Dist-Acc carry-Past-Dec
lit. ‘Two men-Dist carried three suitcases-Dist’

The only difference among these sentences is the occurrences of *ssik*. Let’s first consider (13a). (13a), with *ssik* in the subject position, has two possible interpretations, as given in (14)⁶:

- (14) a. Men in pairs carried each of a set of three suitcases
 $\exists X [X \text{ is a set of three suitcases} \ \& \ \forall x \in X: \exists Y [Y \text{ is a group of two men} \ \& \ \exists e. Y \text{ carried } x \text{ in } e]]$
- b. Two men together carried three suitcases (where happened more than one instance of this, simultaneously or one after another)
 $\exists e. \forall e' \in e: \exists Y [Y \text{ is a group of two men} \ \& \ \exists X [X \text{ is a set of three suitcases} \ \& \ Y \text{ carried } X \text{ in } e']] \ (\lvert e \rvert > 1)$

In (14a), we have a distributive reading of *three suitcases*, which I will refer as *three suitcases-distributive* reading. In (14b), the distribution is over the event *e*, which I will refer as *event-distributive* reading.

On the other hand, (13b), with *ssik* in the object position, has somewhat different interpretations, given in (15):

- (15) a. Two men each carried three suitcases
 $\exists Y[Y \text{ is a group of two men} \ \& \ \forall y \in Y: \exists X[X \text{ is a set of three suitcases} \ \& \ \exists e. y \text{ carried } X \text{ in } e]$
 b. Two men together carried three suitcases (where happened more than one instance of this, simultaneously or one after another)
 $\exists e. \forall e' \in e: \exists Y[Y \text{ is a group of two men} \ \& \ \exists X[X \text{ is a set of three suitcases} \ \& \ Y \text{ carried } X \text{ in } e']] \ (|e| > 1)$ (=14b)

As seen here, *two men*-distributive reading (15a) and event-distributive reading (15b) are available for (13b).

Unlike (13a,b), (13c) where *ssik* is in the subject and the object positions has only one interpretation, event-distributive reading:

- (16) Two men together carried three suitcases (where happened more than one instances of this, simultaneously or one after another)
 $\exists e. \forall e' \in e: \exists Y[Y \text{ is a group of two men} \ \& \ \exists X[X \text{ is a set of three suitcases} \ \& \ Y \text{ carried } X \text{ in } e']] \ (|e| > 1)$ (=14b, 15b)

Given the interpretations in (14)-(16), we find the sentences (13a,b,c) have a common reading: (14b), (15b), and (16) are the same, which is event-distributive reading.

Considering the occurrences of *ssik*, we can compare this with the case of English *each*:

- (17) a. Two men *each* carried three suitcases.
 b. Two men carried three suitcases *each*.
 c. *Two men *each* carried three suitcases *each*.

The configurations of (13a-c) are seemingly similar to those of (17a-c) respectively; in (17a), *each* is present next to a subject. And it is next to an object in (17b), and next to both a subject and an object in (17c). However, the interpretations of (13a-c) and (17a-c) don't match; (17a) and (17b) basically have the same interpretation. And furthermore, (17c) is not allowed in English because of the double occurrences of *each*. On the other hand, *ssik* is allowed in both subject and object positions in one sentence, and also the interpretations become different according to its position. Another difference between *each* and *ssik* in their behavior is that in *each* construction, the distribution is over an argument which *each* associates with (for example, *two men* in (17)), while in *ssik*-construction, the distribution is over an NP which does not contain *ssik* (\forall for example, *three suitcases* in (14a) and an *event* in (14b)).⁷

Another respect to consider regarding the interpretations of *ssik*-construction is that whether an NP in the *ssik*-construction is singular or plural affects the interpretation of the sentence. Consider the sentences in (12) again, which are repeated below:

- (12) a. kyoswu twu-myeng-i haksang twu-myeng-ssik-ul manna-ess-ta

- professor two-Cl-Nom student two-Cl-Dist-Acc meet-Past-Dec
lit. 'Two professors met two students-Dist.'
- b. kyoswu-tul-i haksæng twu-myeng-ssik-ul manna-ess-ta
professor-Pl-Nom student two-Cl-Dist-Acc meet-Past-Dec
lit. 'Professors met two students-Dist.'
- c. ku kyoswu-ka haksæng twu-myeng-ssik-ul manna-ess-ta
the professor-Nom student two-Cl-Dist-Acc meet-Past-Dec
lit. 'The professor met two students-Dist.'
- d. John-kwa Mary-ka haksæng twu-myeng-ssik-ul manna-ess-ta
John-and Mary-Nom student two-Cl-Dist-Acc meet-Past-Dec
lit. 'John and Mary met two students-Dist.'
- e. John-i haksæng twu-myeng-ssik-ul manna-ess-ta
John-Nom student two-Cl-Dist-Acc meet-Past-Dec
lit. 'John met two students-Dist.'

In (12a,b,d), the subjects are plural, and they each have two possible interpretations: the subject NP-distributive reading and event-distributive reading. For example, possible interpretations of (12a) are 'there is a group of two professors and for every member of the professors' group, there is a group of two students s/he met' (*two professors*-distributive reading) and 'there is an event and for every sub-event of the event, there is a group of two professors and a group of two students, and the professors met the students in the sub-event' (event-distributive reading). On the other hand, if the NP in subject positions is singular as in (12c) and (12e), only event-distributive reading is available. For example, (12c) has a singular NP *ku kyoswu* 'the professor' in the subject position, and the only possible interpretation is 'the professor met two students at a time (e.g. there is an event and for every sub-event of the event, there is a group of two students, and the professor met the group of two students in the sub-event)', which is event-distributive reading. So what we observe here is that *ssik*-constructions with plural NPs allow both the plural NP-distributive reading and event-distributive reading, while those with singular NPs allow event-distributive reading only⁸.

In this section, we have seen where *ssik* occurs, what kind of NPs can host *ssik*, what kind of NPs are allowed in *ssik*-construction, and what interpretations are available in *ssik*-construction. Considering what we have seen and discussed above, we get several descriptive generalizations on the behavior of *ssik*:

- (18) The distributivity marker *ssik*
- a. can appear in both subject and object positions
 - b. can be attached only to numeral NPs
 - c. allows both singular and plural NPs (including proper names) as an argument which is present in its sentence and interacts with *ssik* for distributive interpretations, though singular NPs and plural NPs result in different interpretations.
 - d. causes different interpretations according to its position; with one occurrence in either subject or object, both NP(not containing *ssik*)-distributive reading and event-distributive reading are available; with occurrences in both positions, only event-distributive reading is

available.

Given these, we are getting to face some questions: How can we account for these properties? More specifically, how can we derive the interpretations of *ssik*-construction, especially, in a compositional way? How can we explain the difference in the interpretations depending on the position of *ssik* or depending on whether the other argument in the sentence is singular or plural? What role does *ssik* play in a sentence in getting the interpretations? Having these questions in mind, we will seek an analysis for this *ssik*-construction in section 3.⁹

3. Analysis

3.1. Previous Analyses

3.1.1. Choe (1987)

Choe (1987) tries to give a general account for distributivity, including Korean *ssik*, English *each*, and more, by a distributive relation given in (19):

- (19) Dist (A,B)
 $\forall a(\text{i-part}(a, A) \rightarrow \exists B (R(a,B)))$
 (the i-parts of the denotation of A distribute over the denotation of B)

Let's consider an example in (20). According to the distributive relation, possible interpretations in (20a-c) are described as (21a-c) respectively:

- (20) Two examiners marked six scripts. (Choe 1987: 110)
 a. A group of two examiners marked a group of six scripts.
 b. Each of the two examiners marked a group of six scripts.
 c. Each of the six scripts was marked by a group of two examiners.
- (21) a. M (E2, S6)¹⁰
 b. M (E2, S6) & Dist (E2, S6)
 c. M (E2, S6) & Dist (S6, E2)

Basically he assumes that we can apply this account using the distributive relation to *ssik* construction, even though he doesn't explicitly show it. However, even if we apply this to *ssik*-construction, the analysis is limited to describing the interpretations at most and doesn't explain and predict the possible interpretations according to the occurrences of *ssik*.¹¹

Although his analysis has shortcomings in accounting for the properties and interpretations of *ssik*-construction, his work contains some valuable observations on *ssik*-construction. He noticed that there can be a distributive relation between an event argument ('implicit contextual element') and an overt argument (Choe 1987: 3.1, 4.5.3), even though he did not include explicitly how this event argument works in the distributive relation he proposed. Regarding the relevance of an event

argument, I agree with Choe. Though adopting his idea that an event argument can be involved in *ssik*-construction, I will present an analysis of *ssik*-construction in a way different from his in the following section.

In addition to the relevance of an event argument, he finds out that there is some locality requirement, that is, clause-boundness, involved in *ssik*-construction. Here is his example:

- (22) chemwen-tul-i [ai-tul-i phwungsen-hana-ssik-ul sa-ess-ta]-ko
 clerk-Pl-Nom child-Pl-Nom baloon-one-Dist-Acc bought
 malha-ess-ta
 said
 ‘Store-clerks said that children bought a balloon each.’ (Choe 1987:54)

In this example, there are two plural NPs, *chemwentul* ‘clerks’ and *aitul* ‘children’, and the NP containing *ssik* gets a distributive relation only with *aitul*, not with *chemwentul*. Given this, he argues that the distributive relation of *ssik*-construction is clause-bound. With respect to the clause-boundness requirement, I follow Choe. I will discuss this property more in detail in section 4.3.

3.1.2. Gil (1990)

Gil (1990) points out that Choe (1987) misses some possible interpretations of *ssik*-construction, and argues that there can be more possible interpretations. Consider an example:

- (23) saram twu-myeng-i kabang sey-kay-ssik-ul wunpanha-ess-ta (=6a)
 man two-Cl-Nom suitcase three-Cl-Dist-Acc carry-Past-Dec
 lit. ‘Two men carried three suitcases-Dist’

Gil argues that this sentence can have more than one meaning and therefore Choe’s analysis which assigns only one interpretation for the sentence is not enough. According to Choe, the sentence has one meaning, which is ‘two men each carried three suitcases’ (which I call *two men*-distributive reading). On the other hand, Gil observes there are more than one interpretation available: ‘two men each carried three suitcases’ and ‘two men carried the suitcases at a time’. Actually, these are the interpretations I mentioned above as ‘*two men*-distributive reading’ and ‘event-distributive reading’ respectively.

Although he correctly points out Choe’s shortcoming and presents possible interpretations of *ssik*-construction, however, he does not provide a full account of *ssik*-construction. His generalization on the interpretation of *ssik*-construction is paraphrased as follows:

- (24) The Semantic Interpretation of *ssik*:
 In every occurrence of *ssik*, a constituent X containing *ssik* interacts with a semantically plural constituent Y disjoint from X for a distributive interpretation:

[*X ...ssik...*] interacts with [*Y_[+PL] ...*] --> distributive interpretation

Even though this rule somehow captures the configuration where we get the interpretations of *ssik*-construction, however, it is not enough to explain the properties of *ssik*-construction we observed in the previous section, and also, the rule is so general as to have a problem of overgeneration. I mentioned in the previous section that it has been noticed in Choe (1987) that *ssik*-construction shows a locality condition (clause-boundness). But the rule in (24) cannot capture this locality condition. I will discuss this locality condition more in section 4.3.

3.2. An Alternative Analysis

In this section, I seek an alternative analysis of *ssik*-construction. We have seen some possible interpretations of *ssik*-construction in section 2. Let's consider them again here. I repeat the sentences (13a-c) and their respective interpretations (14-16) below.

- (13) a. saram twu-myeng-*ssik*-i kabang sey-kay-lul wunpanha-ess-ta (=5a)
man two-Cl-Dist-Nom suitcase three-Cl-Acc carry-Past-Dec
lit. 'Two men-Dist carried three suitcases'
- b. saram twu-myeng-i kabang sey-kay-*ssik*-ul wunpanha-ess-ta (=6a)
man two-Cl-Nom suitcase three-Cl-Dist-Acc carry-Past-Dec
lit. 'Two men carried three suitcases-Dist'
- c. saram twu-myeng-*ssik*-i kabang sey-kay-*ssik*-ul wunpanha-ess-ta (=7a)
man two-Cl-Dist-Nom suitcase three-Cl-Dist-Acc carry-Past-Dec
lit. 'Two men-Dist carried three suitcases-Dist'
- (14) a. Men in pairs carried each of a set of three suitcases
 $\exists X [X \text{ is a set of three suitcases} \ \& \ \forall x \in X: \exists Y [Y \text{ is a group of two men} \ \& \ \exists e. Y \text{ carried } x \text{ in } e]]$
- b. Two men together carried three suitcases (where happened more than one instance of this, simultaneously or one after another)
 $\exists e. \forall e' \in e: \exists Y [Y \text{ is a group of two men} \ \& \ \exists X [X \text{ is a set of three suitcases} \ \& \ Y \text{ carried } X \text{ in } e']] \ (|e| > 1)$
- (15) a. Two men each carried three suitcases
 $\exists Y [Y \text{ is a group of two men} \ \& \ \forall y \in Y: \exists X [X \text{ is a set of three suitcases} \ \& \ \exists e. y \text{ carried } X \text{ in } e]]$
- b. Two men together carried three suitcases (where happened more than one instance of this, simultaneously or one after another)
 $\exists e. \forall e' \in e: \exists Y [Y \text{ is a group of two men} \ \& \ \exists X [X \text{ is a set of three suitcases} \ \& \ Y \text{ carried } X \text{ in } e']] \ (|e| > 1)$ (=14b)
- (16) Two men together carried three suitcases (where happened more than one instance of this, simultaneously or one after another)

$\exists e.\forall e'\in e: \exists Y[Y \text{ is a group of two men \& } \exists X[X \text{ is a set of three suitcases \& } Y \text{ carried } X \text{ in } e']] (|e| > 1)$ (=14b, 15b)

When we look into these possible interpretations, we can see that an argument containing *ssik* always takes lower scope than the other argument not containing *ssik* in the same sentence, and the distribution is over the element of higher scope. For example, in (14a), *three suitcases* takes a higher scope and *two men* which contains *ssik* takes a lower scope, and in (15a), *two men* takes a higher scope and *three suitcases* which contains *ssik* takes a lower scope. Given this, I propose that *ssik* is a *distributive polarity item* (DPI) which must remain within the scope of the D(istributivity)- operator (Link 1983), just like a negative polarity item which has to be within the scope of a negator (See Ladusaw 1979, Linebarger 1980, Progovac 1988, among others for NPI-related arguments), though it is different in that the D-operator is not lexically realized. The D-operator has the effect of introducing universal quantification over the members of a set denoted by an argument.

- (25) Distributive Polarity Item *Ssik*:
Ssik must be within the scope of the D(istributivity)-operator at LF.

Another point I assume in this analysis is given in (26):

- (26) Quantifier Raising (QR) creates an argument for the D-operator.

In *ssik*-construction, the D-operator is present at LF, and an argument undergoes QR for the D-operator and this argument is distributed over. However, an argument containing *ssik* cannot undergo this movement for the operator, since it has to remain under the scope of the D-operator.

Now let's see how the analysis works for the compositional interpretation of *ssik*-construction. In this analysis, I follow the framework of Heim and Kratzer (1998) regarding the details of QR; following them, I use VP internal subject hypothesis (Kitagawa 1986, Fukui and Speas 1986, Koopman and Sportiche 1991, Huang 1993, among others), and assume that a QP in the object position can undergo QR to the VP-adjoined position to avoid type-mismatch problem, while a subject QP is interpreted in the IP-spec position.

Another assumption I suggest here is given in (27):

- (27) An event argument is present in the LF of *ssik*-construction.

Events have been argued for (Davidson 1967, Parsons 1990, among others). Especially, in a neo-Davidsonian event semantics, it has been argued that a verb is a predicate of events and it is related to its arguments through thematic roles.¹² Although I still assume events in this paper, I will take a somewhat different view of events: I assume not only the relevance of events, but also assume that events can appear as an argument in the LF of *ssik*-construction.

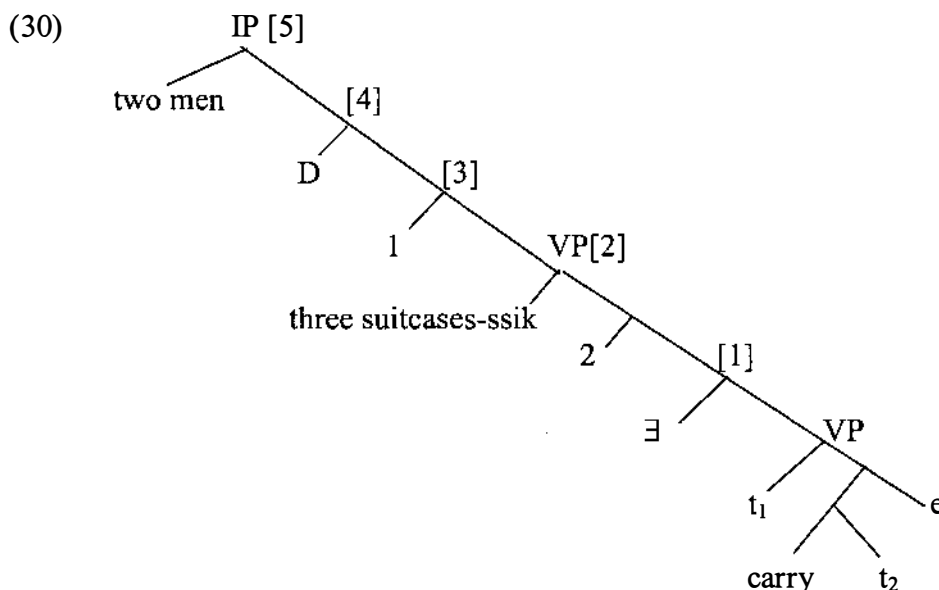
Percus (1998) proposes that situation pronouns be present at LF (see Percus 1998 for detailed arguments). Her analysis of the situation pronouns suggests the possibility that implicit arguments can be realized as explicit ones. In favor of this

possibility¹³, then, we could also assume the presence of events as an explicit argument at LF. So I assume here that events are not only present in semantics but also represented explicitly at LF. In the following part, I will show that we need to assume this for a better account for the interpretations and the properties of *ssik*-construction.

Now let's consider the sentence (6a(=13b)) again, repeated in (28), and see how the analysis works. The sentence in (28) has *ssik* in the object position and has two possible interpretations in (29): *two men*-distributive reading (29a) and *event*-distributive reading (29b). I assume (30) for the *two men*-distributive reading.

(28) saram two-myeng-i kabang sey-kay-ssik-ul wunpanha-ess-ta (=6a,13b)
 man two-Cl-Nom suitcase three-Cl-Dist-Acc carry-Past-Dec
 lit. 'Two men carried three suitcases-Dist.'

- (29) (=15)
- Two men each carried three suitcases
 $\exists Y[Y \text{ is a group of two men} \ \& \ \forall y \in Y: \exists X[X \text{ is a set of three suitcases} \ \& \ \exists e. y \text{ carried } X \text{ in } e]$
 - Two men together carried three suitcases (where happened more than one instance of this, simultaneously or one after another)
 $\exists e. \forall e' \in e: \exists Y[Y \text{ is a group of two men} \ \& \ \exists X[X \text{ is a set of three suitcases} \ \& \ Y \text{ carried } X \text{ in } e']] (|e| > 1)$

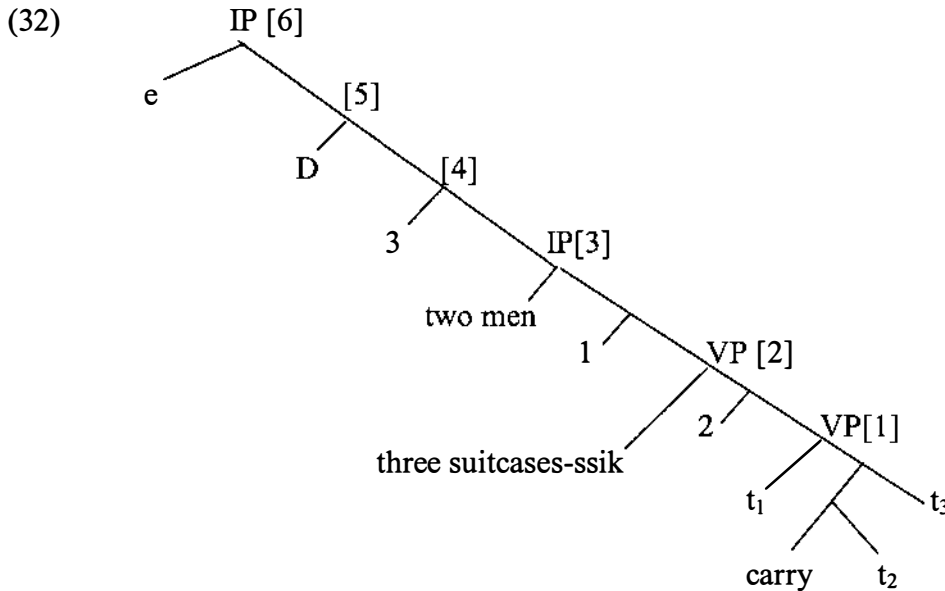


In this LF structure, an event argument e is present as assumed above, and also the D-operator. And *two men* is derived as an argument for the D-operator by QR. Since *ssik*, and therefore the NP containing *ssik*, has to remain under the scope of the D-operator for its licensing, *two men* undergoes QR for the D-operator. And this gets to the *two men*-distributive reading which was given in (29a). The LF and the intermediate steps for a compositional interpretation are given in (31). Here I assume a plural entity of type $\langle e \rangle$, following Link (1983).

- (31) a. LF: [two men [D [1_{IP} t₁ [1 [VP three suitcases-ssik [2 [VP t₁ carried t₂ in e]]]]]]]
- b. [[two men]]: $\lambda R_{\langle e,t \rangle} \exists M [|M|=2 \ \& \ \text{men}(M) \ \& \ R(M)]$
 [[three suitcases]]: $\lambda P_{\langle e,t \rangle} \exists Z [|Z|=3 \ \& \ \text{suitcases}(Z) \ \& \ P(Z)]$
 [[D]]: $\lambda Q_{\langle e,t \rangle} \lambda X_{\langle e \rangle} [\forall x_{\langle e \rangle} \in X: Q(x)]$
- c. [1] $\exists e. \text{carry}(y)(x)(e)$
 [2] $\exists Z [|Z|=3 \ \& \ \text{suitcases}(Z) \ \& \ \exists e. \text{carry}(Z)(x)(e)]$
 [3] $\lambda x. \exists Z [|Z|=3 \ \& \ \text{suitcases}(Z) \ \& \ \exists e. \text{carry}(Z)(x)(e)]$
 [4] $\lambda Y [\forall y \in Y: \exists Z [|Z|=3 \ \& \ \text{suitcases}(Z) \ \& \ \exists e. \text{carry}(Z)(y)(e)]]$
 [5] $\exists M [|M|=2 \ \& \ \text{men}(M) \ \& [\forall y \in M: \exists Z [|Z|=3 \ \& \ \text{suitcases}(Z) \ \& \ \exists e. \text{carry}(Z)(y)(e)]]]$

At last, we get the interpretation in (31c-[5]): *there is a group of two men and for each member of the two men, there is a set of three suitcases and an event of that man carrying three suitcases.*¹⁴

Then how do we get the event-distributive reading for (28)? I assume the structure in (32):



The difference between the LF structure in (30) and the one in (32) lies in the argument undergoing QR for the D-operator; in (30), it is *two men*, and in (32), it is the event argument which I assumed to be present in the LF. In this respect, I am treating the event argument just in a parallel way to the argument *two men*, as in (30). The LF and the intermediate steps for its compositional interpretation are presented in (33). Here I will refer to the type of an event as $\langle i \rangle$.

- (33) a. LF: [e [D [3_{IP} two men [1 [VP three suitcases-ssik [2 [VP t₁ carried t₂ in t₃]]]]]]]]
- b. [[two men]]: $\lambda R_{\langle e,t \rangle} \exists M [|M|=2 \ \& \ \text{men}(M) \ \& \ R(M)]$
 [[three suitcases]]: $\lambda P_{\langle e,t \rangle} \exists Z [|Z|=3 \ \& \ \text{suitcases}(Z) \ \& \ P(Z)]$

- [[D]]: $\lambda Q_{\langle i, t \rangle} \lambda X_{\langle e \rangle} [\forall x_{\langle e \rangle} \in X: Q(x)]$
- c. [1] $\text{carry}(y)(x)(v)$
 [2] $\exists Z [|Z|=3 \ \& \ \text{suitcases}(Z) \ \& \ \text{carry}(Z)(x)(v)]$
 [3] $\exists M [|M|=2 \ \& \ \text{men}(M) \ \& \ \exists Z [|Z|=3 \ \& \ \text{suitcases}(Z) \ \& \ \text{carry}(Z)(M)(v)]]$
 [4] $\lambda v. \exists M [|M|=2 \ \& \ \text{men}(M) \ \& \ \exists Z [|Z|=3 \ \& \ \text{suitcases}(Z) \ \& \ \text{carry}(Z)(M)(v)]]$
 [5] $\lambda X. [\forall x \in X: \exists M [|M|=2 \ \& \ \text{men}(M) \ \& \ \exists Z [|Z|=3 \ \& \ \text{suitcases}(Z) \ \& \ \text{carry}(Z)(M)(x)]]]$
 [6] $\exists e [\forall x \in e: \exists M [|M|=2 \ \& \ \text{men}(M) \ \& \ \exists Z [|Z|=3 \ \& \ \text{suitcases}(Z) \ \& \ \text{carry}(Z)(M)(x)]]]$

At last, we get the interpretation in (33c-[6]): There is an event and for every member of the event, that is for every sub-event, there is a group of two men and a set of three suitcases, and the men carried the suitcases in the sub-event.

As I mentioned in section 1, I assume that events can be plural if they contain sub-events (Krifka 1992, Lasersohn 1995, Landman 1996, 1997, Brisson 1998). And also, I am treating an event as an argument in a parallel way to a lexical argument, thereby having the event argument undergo QR. But some concern arises regarding whether it is conceptually possible to treat an event argument in this way. Heim and Kratzer (1998:210) basically assume that DPs of type e (type of an individual) *can* undergo QR, while DPs of type $\langle\langle e, t \rangle, t \rangle$ (type of a quantifier) *must* undergo QR, and apply the idea to their analysis of VP ellipsis. Here I adopt their idea. And I assume that an event argument can also undergo QR, once it appears as an argument in the LF structure. In (32), therefore, the event argument undergoes QR for the D-operator.

Likewise, we can predict and explain the interpretations of (34).

- (34) saram twu-myeng-ssik-i kabang sey-kay-lul wunpanha-ess-ta (=5a, 13a)
 man two-Cl-Dist-Nom suitcase three-Cl-Acc carry-Past-Dec
 lit. 'Two men-Dist carried three suitcases'

Here is how we get the interpretations. In (34), *ssik* appears with *two men*, and therefore, *two men* has to remain under the scope of the D-operator. On the other hand, the argument *three suitcases* and the event argument can undergo QR, since they do not contain *ssik*. If *three suitcases* undergoes this movement, we will get the LF in (35a) and accordingly, the interpretation in (35b), that is, *three suitcases*-distributive reading. And if the event argument moves, we will get the event-distributive reading in (36b) by the LF in (36a).

- (35) a. LF: [three suitcases [D [2<sub>[IP two men-ssik [1 [VP t₁ carried t₂ in e]]]]]]]
 b. $\exists Z [|Z|=3 \ \& \ \text{suitcases}(Z) \ \& \ [\forall y \in Z: \exists M [|M|=2 \ \& \ \text{men}(M) \ \& \ \exists e. \text{carry}(y)(M)(e)]]]$</sub>
- (36) a. LF: [e [D [3_{[IP two men-ssik [1 [VP three suitcases [2 [VP t₁ carried t₂ in t₃]]]]]]]]]]}

lit. 'John carried three suitcases-Dist.'
 $\exists e. \forall e' \in e: \text{John carried three suitcases in } e' \text{ (} |e| > 1 \text{)}$

(39) has only one interpretation, that is, event-distributive reading. We can correctly predict this with our analysis. If a singular NP undergoes QR for the D-operator, it fails to satisfy the presupposition existing in the meaning of the D-operator. Consider the denotation of the D-operator suggested above:

(40) $[[D]]: \lambda Q_{\langle e/i, t \rangle} \lambda X [\forall x \in X: Q(x)]$

Given the denotation, the D-operator naturally requires a set including more than one member. That is, the cardinality of X should be more than one. Therefore, QR of a singular NP for the D-operator will not make it felicitous. In (39), if we allow *John* to undergo QR, it will not satisfy the requirement of the D-operator ($\#\forall x \in \{\text{John}\}$). Therefore, the only possibility is to QR the event argument *e*, and this is why (39) can have only one interpretation.

4.2. Individual-level predicates and *ssik*-construction

Another phenomenon is related to the distinction between individual-level predicates and stage-level predicates (Kratzer 1995). Consider the sentence in (41):

- (41) a. John-kwa Mary-ka wekuko twu-kaji-ssik-ul a-n-ta
 John-and Mary-Nom foreign language two-Cl-Dist-Acc know-
 Pres-Dec
 lit. 'John and Mary know two foreign languages-Dist.'
 b. $\forall x \in \text{John and Mary}: x \text{ knows two foreign languages.}$

The sentence in (41a) includes an individual-level predicate *anta* 'know'. The sentence has only one possible interpretation, which is given in (41b); an event-distributive reading is not allowed here. And given that an individual-level predicate does not involve an event (Kratzer 1995), the only interpretation in (41b) will be correctly explained in the proposed analysis. If the sentence does not have an event argument in the LF, due to the specific property of the verb, and thereby has no possibility of moving it for the D-operator, then the only possibility will be to QR an argument other than *e* and accordingly, an event-distributive reading will not be possible. In (41), since it does not have an event argument in its LF, we can only move *John and Mary* for the D-operator, getting the interpretation in (41b).¹⁵

This reasoning predicts that if there is no semantically plural NP with an individual-level predicate, then the *ssik*-construction will not be properly licensed, which is correct, given (42).

- (42) ?? John-un wekuko twu-kaji-ssik-ul a-n-ta
 John-Top foreign language two-Cl-Dist-Acc know-Pres-Dec
 lit. 'John knows two foreign languages-Dist.'

This sentence sounds weird; it is hard to think of any proper interpretation for this sentence. Considering that the sentence does not have any semantically plural NP (except the NP with *ssik*) and contains an individual-level predicate, we can say the sentence is bad because there is no argument to move for the D-operator at LF. The example in (43) confirms our story further.

- (43) John-un wekuko twu-kaji-ssik-ul paewu-n-ta
 John-Top foreign language two-Cl-Dist-Acc learn-Pres-Dec
 lit. 'John learns two foreign languages-Dist.'

For (43), an event reading is possible: *in every event (of John's learning foreign languages), John learns two foreign languages*. The sentence contains a stage-level predicate, *paewunta* 'learn'. So an event argument can be present in its LF and this event argument can undergo QR getting the event-distributive reading.

4.3. Locality Condition (Clause-boundness) on *Ssik*-construction:

Another phenomenon I would like to discuss is the locality condition (clause-boundness) on *ssik*-construction. As mentioned briefly in section 3.1., Choe (1987) observes that there is some locality condition involved in *ssik*-construction, that is, a distributive relation is allowed only between two arguments in a same clause. Consider the sentence in (44):

- (44) ??kyoswu-twu-myeng-ssik-i John-i wekuko sey-kaji-lul
 professor-two-Cl-Dist-Nom John-Nom foreign language three-Cl-Acc
 paewu-ess-ta-nunkes-ul a-n-ta
 know-Past-Dec-that-Acc know-Pres-Dec
 lit. 'Two professors-Dist knows that John learned three foreign languages.'

We have seen above that the sentence (42) (*John knows two foreign languages-Dist*) is bad since any distributive reading caused by *ssik* is not allowed. That is, since the argument *John* is not plural, *John*-distributive reading is not possible. And also, since the predicate is an individual-level predicate and therefore an event argument is not present in its LF structure, event-distributive reading is not possible either. The example (44) includes an individual-level predicate (*know*) in the matrix clause, and there is no plural argument in the matrix clause, though there is one plural argument in the embedded clause (*three foreign languages*). In (44), the distributive marker *ssik* appears in the matrix clause. But since the matrix clause contains an individual-level predicate which does not involve an event argument, and has no plural argument in it, no argument is available for the D-operator, as far as the matrix clause is concerned. Therefore, remaining possibility to consider now is whether the plural argument or/and the event argument in the embedded clause can undergo QR for the D-operator in the matrix clause. If it is possible and therefore, a distributive reading is allowed between two arguments which are not in a same clause, we expect to get a distributive interpretation between *two professors-Dist* and *three foreign languages*, or/and a distributive reading between *two*

professors-Dist and an *event* argument in the embedded clause. However, the sentence (44) doesn't allow any distributive reading and the sentence is still bad. This suggests that distributivity caused by *ssik* is clause-bound and a distributive interpretation is allowed only between arguments in a same clause.

Let us consider another example:

- (45) John-i chinku han-myeng-ssik-ekey haks-aengtul-i
 John-Nom friend one-Cl-Dist-Dat students-Nom
 paewu han-myeng-ssik-ul manna-ess-ta-ko malha-ess-ta
 actor one-Cl-Dist-Acc meet-Past-Dec-Comp say-Past-Dec
 lit. 'John said to one friend-Dist that students met an actor-Dist'

This sentence has two possible interpretations:

- (46) $\exists e. \forall e' \in e$: in e' , John said to one friend that
 i) each of the students met an actor
 ii) students (together) met actors one at a time

Like (44), distributive interpretations between a matrix-clause argument and an embedded-clause argument are not possible to get here. As seen in (46), the interpretation of (45) is two-way ambiguous; for the matrix clause, only event-distributive reading is possible, since *John* is a singular noun; for the embedded clause, both *students*-distributive reading and event-distributive reading are possible. However, no distributive relation between *one friend* in the matrix clause and *students* in the embedded clause is allowed, that is, the interpretation where the embedded clause argument *students* takes the highest scope in the whole sentence is not possible to get. And this also tells us that distributivity of the *ssik*-construction is clause-bounded. With the proposed analysis, we can predict this clause-boundness of *ssik*-construction, since we are assuming QR of an argument for the D-operator and QR is regarded as a clause-bound operation.^{16 17}

5. Conclusion

In this paper, I have investigated the properties of *ssik*-construction and presented an analysis to account for them properly. In the analysis, I have suggested that *ssik* must be in the scope of the D-operator in LF, and that event can appear as an argument in the LF of *ssik*-construction. By these, we could more properly explain and predict the interpretations of *ssik*-construction and some relevant phenomena found in *ssik*-construction.

Through the accounts, we have seen that *ssik* causes other arguments in the sentence (not the one it is attached to) to be distributed. Given this property, we could refer to *ssik* more correctly as *anti-distributivity marker* or *non-distributed distributivity marker*, rather than a distributivity marker.

In this paper, I argued that we can give a better account for *ssik*-construction by assuming the presence of the event argument *e*. Hence, to the extent that the proposed analysis is on the right track, it would illuminate the possibility that events

can be treated as an argument which is parallel to an <e> type argument.

Another implication we get from the proposed analysis is regarding “polarity”. I believe that the proposed analysis implies that polarity could reach more linguistic properties, not limited to negative and/or positive polarity, though further attention is required regarding this respect.

Endnotes

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¹ In this paper, I will use the following abbreviated terms:

Nom: nominative, Acc: accusative, Dat: dative, Top: topic marker, Cl: classifier, Dist: distributivity marker, Dec: declarative, Pl: plural marker, Pres: present tense, Q: question marker

² More exactly, this reading can be interpreted in two ways: collective reading or cumulative reading. One is that John and Mary together participated in carrying each of three suitcases: *collective reading* (e.g. Link 1983). The other is that there are three suitcases, and John carried two of them and Mary carried one of them (or the other way around), so as a result, those three suitcases were carried by John and Mary: *cumulative reading* (e.g. Scha 1984). However, I will not focus on the distinction between collective reading and cumulative reading in this paper.

³ I have found some informants prefer *ssik* in object positions, unlike me and other informants.

⁴ In Korean, classifiers are not needed when numerals are not present. So the absence of the classifier in (8b) and (9b) is due to the missing numerals.

⁵ By *numeral NPs*, I mean numerals (e.g. *two*) and some quantifiers which can be construed as *how many* (e.g. *several, a few*).

⁶ Both interpretations in (13a) and (13b) are possible to get even though the interpretation in (13a) is more salient than the one in (13b).

⁷ Here I do not mean to lead to an easy conclusion that *ssik* and *each* are totally different. In (17), the sentences are compared with those in (13) in terms of surface configurations only. But this comparison is not thorough at all. Sentences such as (17b) can be closely related to *ssik*-construction. Consider the following examples:

- (i) a. I gave each of them five dollars.
b. I gave them five dollars each. (Postal 1974:208)

The kind of *each* in (ib), which is referred to as *binominal each* (Safir and Stowell 1988) or *shifted each* (in the sense of the operation “*each shift*” (Postal 1974)), is similar to *ssik* in that the argument it is associated with is not distributed and has scope lower than the other argument. Choe (1987) also noticed this similarity and tried to present a unified account. Even though they show some similar property, they still have some difference in the interpretations: (17b) does not have the event-distributive reading which is possible for (13b) and has *two men*-distributive reading only. With lack of evidences for a full account, more complete comparative study of these constructions will remain for further research.

⁸ Actually, there is some restraint on the event-distributive reading with respect to the kinds of predicates. It will be discussed in detail in section 4.1.

⁹ We will see in the later sections why the *ssik*-construction shows the properties given in (18). However, I do not have any theoretical account for the property in (18b) to provide in this paper, why only numerals can host *ssik* has to be explained. Here I will leave it for further research.

¹⁰ M (E2, S6), where M denotes an action ‘marked’, E2 is a variable for the plural individual ‘two examiners’, and S6 is a variable for plural individual ‘six scripts’ (Choe 1987:111)

¹¹ This might be caused because he overlooks some possible occurrences and interpretations of *ssik*-construction. He did not include the event-distributive reading of *ssik*-construction.

¹² According to this view, the sentence in (i) has the representation in (ii):

(i) The choir sang the Marseillaise.

(ii) $\exists e$ [sing(e) & agent (e, the_choir) & theme (e, the_Marseillaise)]

¹³ Adopting this possibility does not necessarily mean that we are treating events as equivalent to situations. It has been often assumed that situations are generally compatible with events (Kratzer 1989, von Stechow 1994). However, we will not follow this position in this paper. In section 4.2, we will discuss why different kinds of predicates (individual-level vs. stage-level (Kratzer 1995)) cause different interpretations in the *ssik*-construction. And the account for this will be based on the presence/absence of an event argument. If we assume an equivalent status between a situation and an event, then we will face a problem of contradiction. We will get to this again in section 4.2

¹⁴ In this analysis, I am not necessarily assuming that only one instance of the D-operator is possible. It seems that nothing available in this theory prevents multiple instances of the D-operator a priori. Let us consider the possibility then. If we basically allow multiple instances of the D-operator, one possible LF derived by the sentence (28) will be the following:

(i) $[_{IP}$ two men $[D$ $[1$ $[e$ $[D$ $[3$ $[$ three suitcases-*ssik* $[2$ $[_{VP}$ t_1 carried t_2 in t_3 $]]]]]]]]]$

Then it will lead to the following interpretation, using the denotations given above:

(ii) $\exists M[\text{men}(M) \& |M|=2 \& \forall y \in M: \exists e[\forall x \in e: \exists z[\text{suitcases}(z) \& |z|=3 \& \text{carry}(z)(y)(x)]]]$

However, this interpretation is not possible with the sentence (18) and therefore, multiple instances of the D-operator does not seem right. Regarding this, for now, I will assume that the occurrences of the D-operator depend on the lexical item *ssik* and that there is one to one correspondence between the D-operator and a lexical item which requires it. Other than the occurrences based on the lexical items, it seems hard to guarantee the occurrence of the D-operator, given that a distributive reading is rarely possible with the following example:

(iii) John-kwa Mary-ka kabang sey-kay-lul wurpanha-ess-ta (=4)

John-and Mary-Nom suitcase three-Cl-Acc carry-Past-Dec

lit. 'John and Mary carried three suitcases.'

¹⁵ As mentioned in section 3.2 (and footnote 13), I am partly adopting the possibility suggested in Percus (1998) that implicit arguments can be realized explicitly at LF. Actually, her examples include stage-level predicates, and the sentences containing those predicates have situation pronouns which are realized as explicit arguments. Given this, if we assume that situations are compatible with events, following Kratzer (1989) and von Stechow (1994), then we will not be able to distinguish stage-level predicates from individual-level predicates with respect to the presence of an event argument. Therefore, to avoid any contradiction, I will just assume that situations and events may be different, though it needs more evidence to argue.

¹⁶ Choe (1987) mentioned that the clause-boundness requirement is involved in *ssik*-construction, except for the implicit event argument. In my analysis, however, I do not have to have an exception, since event appears as an argument in the LF and therefore, we can say that the requirement applies uniformly to every argument including the event argument.

¹⁷ We are considering NPIs and *ssik* as a DPI in a parallel way. But, considering an English sentence like *I didn't say that anyone liked it*, it seems that they don't match with respect to clause-boundness. However, note that the clause-boundness of *ssik*-construction is not due to *ssik* itself, but due to an argument which undergoes QR for the D-operator.

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