Distributivity in an Event Semantics

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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-szik-ul wunpanha-ess-ta
    John-and Mary-Nom suitcase three-CI-Dist-Acc carry-Past-Dec
    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)
    \( \exists e. \forall e': e \in e: \text{John and Mary together carried three suitcases in } e' \)

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, Lasersohn 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-CI-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; 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-CI-Dist-Nom suitcase three-CI-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-CI-Dist-Nom suspect two-CI-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-CI-Nom suitcase three-CI-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-CI-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-CI-Dist-Nom suitcase three-CI-Dist-Acc carry-Past-Dec
   lit. ‘Two men-Dist carried three suitcases-Dist’
   b. haksaeng twu-myeng-ssik-i nonmun han-pyun-ssik-ul palpyoha-ess-ta
   student two-CI-Dist-Nom paper one-CI-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-CI-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, 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):


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

    lit. ‘Two professors met John and Mary-Dist’
   b. *kyoswu twu-myeng-i Mary-ssik-ul mann a-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. Now let us consider whether there is any kind of requirement for other NPs in ssik-construction.

(12) a. kyo swu twu-myeng-i haks aeng 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. kyo swu-tul-i haks aeng twu-myeng-ssik-ul manna-ess-ta professor-Pl-Nom student two-Cl-Dist-Acc meet-Past-Dec
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lit. ‘Professors met two students-Dist.’
c. ku kyoswu-ka haksaeang 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 haksaeang 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 haksaeang 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-Dis t-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):

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

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)).

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 haksaeng twu-myeng-ssik-ul manna-ess-ta
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 only.

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
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.

3. Analysis

3.1. Previous Analyses


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) \[
\text{Dist}(A,B) \equiv \forall a (\text{i-part}(a, A) \rightarrow \exists b \ (R(a,b)))
\]

(let 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)
    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-PI-Nom child-PI-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-CI-Nom suitcase three-CI-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[P,L] ... ] \rightarrow \text{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-CI-Dist-Nom suitcase three-CI-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-CI-Nom suitcase three-CI-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-CI-Dist-Nom suitcase three-CI-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 is a set of three suitcases & \forall x \in X: \exists Y[Y is a group of two men & \exists e. Y carried x 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':\exists Y[Y is a group of two men & \exists X[X is a set of three suitcases & Y carried X in e' ]]) (|e| >1)

(15) a. Two men each carried three suitcases
\exists Y[Y is a group of two men & \forall y \in Y: \exists X[X is a set of three suitcases & \exists e. y carried X 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':\exists Y[Y is a group of two men & \exists X[X is a set of three suitcases & Y carried X in e' ]]) (|e| >1)

(16) Two men together carried three suitcases (where happened more than one instance of this, simultaneously or one after another)
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. 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
possibility\textsuperscript{13}, 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): \textit{two men}-distributive reading (29a) and \textit{event}-distributive reading (29b). I assume (30) for the \textit{two men}-distributive reading.

\begin{itemize}
\item [(28)] \begin{quote}
\begin{flushleft}
\text{saram twu-myeng-i kabang sey-kay-ssik-ul wunpanha-ess-ta (=6a,13b)}
\text{man two-Cl-Nom suitcase three-Cl-Dist-Acc carry-Past-Dec}
\end{flushleft}
\end{quote}
lit. ‘Two men carried three suitcases-Dist.’
\end{itemize}

\begin{itemize}
\item [(29)] \begin{quote}
\begin{flushleft}
\begin{enumerate}
\item Two men each carried three suitcases
\item Two men together carried three suitcases (where happened more than one instance of this, simultaneously or one after another)
\end{enumerate}
\end{flushleft}
\end{quote}

\begin{itemize}
\item [(30)] \begin{quote}
\begin{itemize}
\item IP \begin{itemize}
\item two men \begin{itemize}
\item D \begin{itemize}
\item three suitcases-ssik \begin{itemize}
\item \exists \begin{itemize}
\item \exists \begin{itemize}
\item \exists \begin{itemize}
\item VP \begin{itemize}
\item carry \begin{itemize}
\item e \begin{itemize}
\item t\textsubscript{1} \begin{itemize}
\item t\textsubscript{2}
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In this LF structure, an event argument \(e\) is present as assumed above, and also the D-operator. And \textit{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, \textit{two men} undergoes QR for the D-operator. And this gets to the \textit{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 \(<e>\), following Link (1983).
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 $<\i>$. 

(33) a. LF: [e [D [3[IP two men [1[VP three suitcases-ssik [2[VP t_1 carried t_2 in e])]]]]]]

b. [ [two men]]: $\lambda R_{<e,p}\exists M$ [ $|M|=2$ & men (M) & R(M) ]
[[ three suitcases ]]: $\lambda P_{<e,p}\exists Z$ [ $|Z|=3$ & suitcases (Z) & P(Z) ]
[[ D ]]: $\lambda Q_{<e,p}\forall X_{<e} [ \forall x_{<e} \in X: Q(x) ]$

c. (1) $\exists e. \text{carry}(y)(x)(e)$
   (2) $\exists Z$ [ $|Z|=3$ & suitcases (Z) & $\exists e. \text{carry}(Z)(x)(e)$ ]
   (3) $\lambda x.\exists Z$ [ $|Z|=3$ & suitcases (Z) & $\exists e. \text{carry}(Z)(x)(e)$ ]
   (4) $\lambda Y[ \forall y \in Y: \exists Z$ [ $|Z|=3$ & suitcases (Z) & $\exists e. \text{carry}(Z)(y)(e)$ ] ]
   (5) $\exists M$ [ $|M|=2$ & men(M) & $[ \forall y \in M: \exists Z$ [ $|Z|=3$ & suitcases(Z) & $\exists e. \text{carry}(Z)(y)(e)$ ] ]

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 $<\i>$. 

(33) a. LF: [e [D [3[IP two men [1[VP three suitcases-ssik [2[VP t_1 carried t_2 in t_3]]]]]]]]

b. [ [two men]]: $\lambda R_{<e,p}\exists M$ [ $|M|=2$ & men (M) & R(M) ]
[[ three suitcases ]]: $\lambda P_{<e,p}\exists Z$ [ $|Z|=3$ & suitcases (Z) & P(Z) ]
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 <<e,t>> (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 unergoes 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[IP two men-ssik [1 [VP t1 carried t2 in e]]]]]]
b. ∃Z [ |Z|=3 & suitcases(Z) & [∀yεZ:∃M[ |M|=2 & men(M) &
ε. carry(y)(M)(e)]]]

(36) a. LF: [e [D[3[IP two men-ssik [1 [VP three suitcases [2 [VP t1 carried

```
b. \(\exists e[\forall x \in e: \exists M[|M|=2 \text{ and } \text{men}(M) \text{ and } \exists Z[|Z|=3 \text{ and } \text{suitcases}(Z) \text{ and } \text{carry}(Z)(M)(x)]]]\)

Now consider another example, which has *ssik* in both subject and object position. (37) has only one interpretation, which is event-distributive reading.

(37) *saram twu-myeng-ssik-i kabang sey-kay-ssik-ul wunpanha-ess-ta (=7a,13c)* 
*man two-CI-Dist-Nom suitcase three-CI-Dis t-Acc carry-Past-Dec*

*lit. 'Two men-Dist carried three suitcases-Dist'*

In (37), since both the subject and the object contain *-ssik*, they must remain under the D-operator and therefore the only possibility for an argument to move for the D-operator lies in the event argument. When the event argument *e* undergoes QR, we will get the structure in (38a) at LF and the interpretation in (38b).

(38) a. LF: 
\[
\{[e[D\{[\text{two men-ssik} \text{[[1} \text{[vp three suitcases [2} \text{[vp t1 carried t2 in t3 }]]]]]]\}]]\}
\]

b. \(\exists e[\forall x \in e: \exists M[|M|=2 \text{ and } \text{men}(M) \text{ and } \exists Z[|Z|=3 \text{ and } \text{suitcases}(Z) \text{ and } \text{carry}(Z)(M)(x)]]]\)

Given that we have only one argument to move in this case, the fact that we have only one interpretation for (37) is correctly explained and predicted in the framework of the proposed analysis. Besides, by assuming the presence of an event argument at LF and the possibility of QR of it, we can account for why the event-distributive reading is common for (24), (34), and (37).

In this section, I have proposed an analysis of *ssik*-construction. The analysis assumed that an argument containing *ssik* must remain in its position under the scope of the D-operator, while the other arguments in the sentence can move for the D-operator, and that event is present as an argument in the LF and also can undergo the same kind of movement. By assuming these, we could correctly explain and predict the interpretations of *ssik*-construction, especially capturing the interpretations which are different depending on the occurrence of *ssik*.

4. Discussion for the Analysis

In this section, I will discuss some relevant phenomena of *ssik*-construction, supporting my analysis further.

4.1. Event-distributive Reading Only with Singular NPs

As mentioned in section 2 briefly, if the argument which is not containing *ssik* is a singular NP, only event-distributive reading is possible to get. Let’s take an example in (39):

(39) *John-i kabang say-kay-ssik-ul wunpanha-ess-ta*

*John-Nom suitcase three-CI-Dist-Acc carry-Past-Dec*
lit. 'John carried three suitcases-Dist.'
\[
\exists e. \forall e' \in e: \text{John carried three suitcases in } e' \ (|e| > 1)
\]

(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:

\[
[[\text{D}]] : \lambda Q_{e,1,p} \lambda X [\forall x \in X : Q(x)]
\]

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-CI-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 \(\text{anta} \, \text{`know'}\). 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 \(\text{John and Mary}\) 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 \text{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-CI-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-CI-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-CI-Dist-Nom John-Nom foreign language three-CI-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 haksaengtul-i
    John-Nom friend one-CI-Dist-Dat students-Nom
    paewu han-myeng-ssik-ul manna-ess-ta-ko malha-ess-ta
    actor one-CI-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' 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.\textsuperscript{16} \textsuperscript{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
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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

* I would like to thank Howard Lasnik, Yael Sharvit, and especially Sigrid Beck for encouragement and many helpful comments and suggestions. And also, I thank Barbara Partee for introducing the topic to me.

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

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

(i) The choir sang the Marseillaise.
(ii) \[ \exists e [\text{sing}(e) \& \text{agent}(e, \text{the choir}) \& \text{theme}(e, \text{the Marseillaise})] \]

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 comparable with events (Kratzer 1989, von Fintel 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.

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

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

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

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-CI-Acc cany-Past-Dec
    lit. 'John and Mary carried three suitcases.'

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 Fintel (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.

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.

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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