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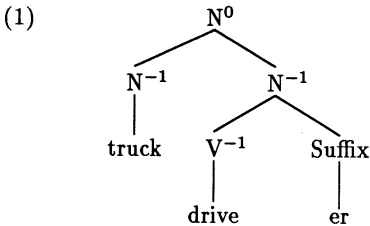
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Introduction

In this paper, I will discuss verbal compounds (=synthetic compounds) from a morphosyntactic point of view. The paper consists of two parts. First, morphosyntactic evidence will be provided for the structure of the verbal compound in which compounding precedes the suffixation. Secondly, based on Grimshaw's (1990) theory of argument structure, I propose the "no external argument" condition to describe Korean verbal compounds rather than the "no subject condition" proposed by Selkirk (1982).

1. Morphological Structure

The verbal compounds involve both compounding and derivation. If we follow the level-ordering hypothesis (Allen 1978) in which derivation is followed by compounding, and then by inflection, the structure given in (1) would be the morphological structure for the verbal compounds.



With the structure in (1), we treat verbal compounding exactly like other compounding, that is, two nominal stems combine to make a compound word.

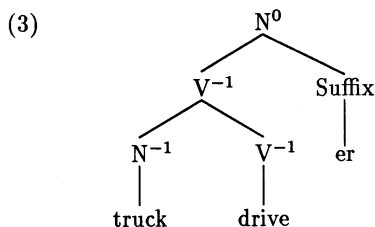
Sohn (1987) assumes the structure in (1) to explain phonological facts such as neutralization and palatalization in Korean, which suggest that the verbal stem and the derivational suffix are a unit.

- (2) Neutralization
- a. $[[k'oc^h][k'oc-i]] \rightarrow *[k'otk'odi] [k'otk'oji]$
'flower-put-nml (flower arrangement)'
- Palatalization
- b. $[[hæ][tot-i]] \rightarrow [hædoji] *[hædoti]$
'sun-rise-nml (sun rise)'

However, in the framework of prosodic phonology, Han (1991) has observed that morphological structure and phonological bracketing are mismatched in many cases. Therefore, phonological evidence cannot be a valid argument for the morphological structure.

Selkirk (1982) assumes this structure given the fact that compounds with the composition of [N V] do not exist in English: Most [N V] compounds such as *baby-sit*, and *brow-beat* are formed by back-formation. Such an argument is based on the assumption that every subtree of the word tree is a word. There is no verb *truck-drive* in English. However, typical examples of verbal compounds such as *church-goer* and *bird-watcher* are problematic to this assumption, since the right-hand stem of each compound, *goer*, *watcher*, is not an existing lexical item in English. We might introduce a constraint that filters out an [N V] compound as a word in English (W. Croft (p.c.)). The constraint would rule out the compounded verbs as the output of the lexicon. The verbal compounds are nouns or adjectives when they come out of the word-formation component, hence the constraint does not apply. It is ad hoc to preclude the [N V] compounding rule itself in the Grammar. Compared with English, Korean has a more general constraint: in order for a verbal stem to be a word, it always needs a derivational or inflectional morpheme. In other words, every verbal stem is a bound morpheme, whether it is simple or complex. Therefore, the lack of a word which consists of simply [N V] cannot be evidence for the structure in (1).

In the following section, I will argue for the structure in (3) as the proper morphological structure of the verbal compound (cf. Lieber 1983).



2. Eventive vs. Non-eventive Verbal Compounds

There are two types of verbal compounds: while one type of compound denotes an event, the other type denotes a referential object. The distinction hinges on the suffix. This fact can be easily captured under the assumption of the morphological structure given in (3), which has a suffix as the head. I will discuss the two main differences between the two types of verbal compounds:

argument linking and cooccurrence with duration adverbials, and show that these differences cannot be accounted for with the structure in (1).

2.1. Argument Linking beyond a Compound

The previous studies on verbal compounds (Roeper and Siegel 1978, Selkirk 1982, Lieber 1983, Sugioka 1984, etc.) have been concerned only with the argument of the verbal stem satisfied within the compound. What happens to the other arguments if the verbal stem has more than one argument?

Recall that the head of a morphological structure is the right-hand sister according to Williams (1981b). If the two structures in (1) and (3) are considered with this assumption, the right-hand nominal stem is the head in (1), whereas the suffix is the head in (3). In either structure, the verbal stem itself is not the head of the whole compound. Given that morphological operations take place in the lexicon, and that syntactic operations will be blind to the internal structure and the features of the non-head of a lexical item (Mohanan 1986), it follows that the argument of the non-head (verbal stem) must not be linked outside the verbal compound.

However, consider the examples in (4).

- (4) a. Sandy-uy mal-tha-ki
 Sandy-GEN horse-ride-nml
 'Sandy's (Agent) horse-riding'
- b. Sandy-uy pyeng-tta-kay
 Sandy-GEN bottle-open-nml
 'Sandy's (Possessor, *Agent) bottle-opener'

Genitive marked noun phrases outside of verbal compounds are interpreted differently: *Sandy* is Agent of the verbal compound in (4)a, while it is Possessor in (4)b. In other words, the left-over argument of the verbal stem is linked to the NP outside of the compound in (4)a, but cannot be linked in (4)b. I will call these two types of verbal compounds the eventive and non-eventive verbal compounds, respectively.

2.2. Cooccurrence with Duration Adverbials

In addition to the distinction in argument linking, we find another contrast between the two types of verbal compounds.

- (5) a. han sikan tongan-uy mal-tha-ki
 one hour during-GEN horse-ride-ing
 'horse-riding for an hour'
- b. *han sikan tongan-uy pyeng-tta-kay
 one hour during-GEN bottle-open-er
 'bottle-opener for an hour'

(5) shows that an aspectual modifier such as a duration adverbial can cooccur with an eventive verbal compound and not with the other. Grimshaw (1990) explicates the difference between what I will call eventive nominals and non-eventive nominals. Cooccurrence with aspectual modifiers is one of the main differences. What should be noted is that when a duration adverbial modifies an eventive verbal compound, it modifies the event which the verbal stem denotes. (5)b is acceptable in a special situation, eg., where someone says “this was my bottle-opener (used) for an hour” referring to an object which is not a conventional bottle-opener. But, in such a case, what is modified by the duration adverbial is not the event of *opening* but the event of *using*. The important distinction is whether a durational adverbial can modify the event denoted by the verbal stem in a verbal compound or not.

A few more examples of eventive and non-eventive verbal compounds are given in (6) and (7).

(6) Eventive Verbal Compounds

- | | |
|-------------------------------------|--|
| a. cang-po-ki
'grocery-shopping' | b. phato-tha-ki
'wave-riding (surfing)' |
| c. yen-nalli-ki
'kite-flying' | d. kong-kwulli-ki
'ball-rolling' |
| e. hay-tot-i
'sun-rise' | f. seyspang-sal-i
'living in a rented room' |

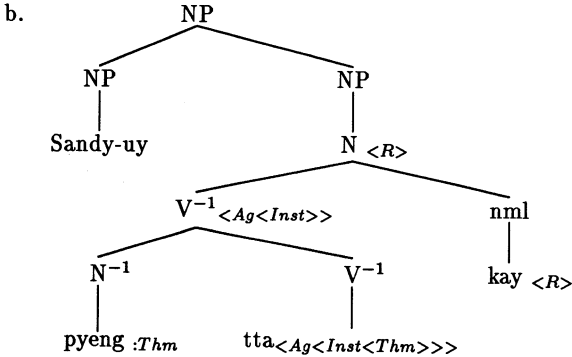
(7) Non-eventive Verbal Compounds

- | | |
|--|--|
| a. yenphil-kkakk-i
'pencil-sharpener' | b. cec-mek-i
'breast milk-eat-nml (baby)' |
| c. os-kel-i
'clothes-hanger' | d. cay-thel-i
'ash-shaker (ash tray)' |
| e. kil-cap-i
'road-catcher (guide)' | f. halwu-sal-i
'one day-live-nml (day-fly)' |

2.3. An Analysis: Eventive vs. Non-eventive Nominalizer

Let us see how we can capture the differences of the two types of verbal compounds in the proposed structure. I propose that the distinction comes from the different lexical information in each suffix. The suffixes in non-eventive verbal compounds such as in (8)a have the “*R*(eferential)” role (Williams 1981a) in their argument structures and make derived nouns referential objects. (8)b shows the argument linking involved in the phrase in (8)a,¹ and (8)c is lexical information of the suffix *kay*.²

- (8) a. Sandy-uy pyeng-tta-kay
 Sandy-GEN bottle-open-nml
 'Sandy's bottle-opener'



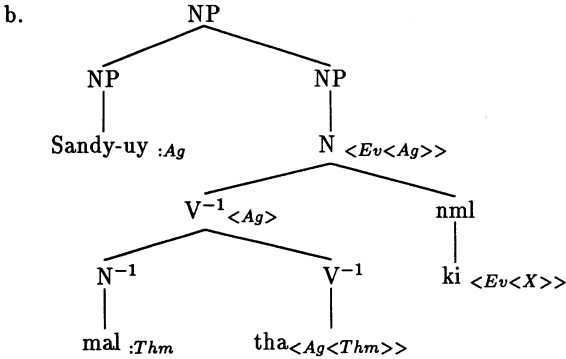
- c. *kay*: subcategorization [V *a.s.<...Instrument...>* —] N
 argument structure *R <= Instrument >*

(The suffix *-kay* subcategorizes for a verb to make a noun, and the derived noun denotes a referential object, which is identified with the Instrument role of the verb stem.)

As the compound inherits the argument structure from its head, the suffix *kay*, the Event structure which is contained in the verb stem's argument structure has no effect, and neither can the left-over argument be linked to the genitive NP outside the whole compound noun.

It is shown that in the case of eventive verbal compounds, a genitive NP can be interpreted as an argument of the verb stem and a duration adverbial can modify the event denoted by the verbal stem. To explain these facts, we should make sure that even though the suffix, as the head, determines the category of the whole compound, it must not block the argument structure of the verbal stem from percolating up to the whole compound. This is achieved by a special property of particular suffixes, which inherit the argument structure of their sister constituent to compose with their own argument structures. A similar mechanism is proposed for the complex predicates in Sells (1991). (9)b illustrates the argument linking involved in the phrase with an eventive verbal compound in (9)a, and (9)c shows the argument structure sharing between the eventive suffix *-ki* and the verbal stem.

- (9) a. Sandy-uy mal-tha-ki
 Sandy-GEN horse-ride-nml
 'Sandy's horse-riding'

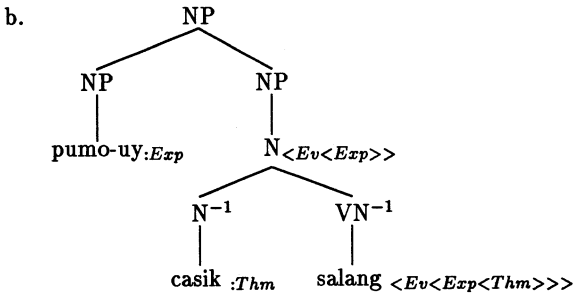


- c. ki: subcategorization [V_{a.s.}<X> —] N
 argument structure < Ev < X >>

(The eventive suffix *ki* subcategorizes for a verbal stem and inherits its argument structure including the event structure, which fills in the external argument position in the argument structure of the suffix.)

The proposed analysis makes a correct prediction regarding compounds which have verbal nouns as their right-hand stems, as in (10)a.³

- (10) a. pumo-uy casik-salang
 parent-GEN child-love
 'parent's love for children'



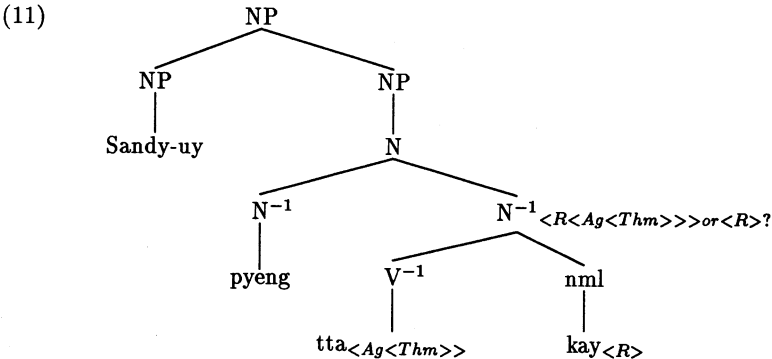
Compounds with a verbal noun such as *casik-salang* are all eventive nominals. Since there is no suffix involved, and no verbal noun denotes a referential object, there is no way the whole compound gets the *R* role. Accordingly,

the event structure and the argument structure of the verbal noun which is the head percolate up to the compound except for the argument which is linked to the left nominal stem, as shown in (10)b. Therefore, the genitive NP is interpreted as the remaining argument (Experiencer) of the verbal noun in (10)a.

To sum up, verbal compounds are distinguished as either eventive or non-eventive compounds depending on the suffix. As the suffix of the verbal compound is posited as the head in the proposed structure, the different properties of the two types of verbal compounds can be easily captured.

2.4. Problem of the Other Structure

This section is concerned with the non-eventive verbal compounds under the assumption of the other structure, where suffixation precedes compounding. The phrase in (9) would be analyzed as follows (cf. Di Sciullo and Williams 1987).



With the structure in (11), we get a dilemma. The head of the right-hand nominal stem *tta-kay* 'opener' is the suffix *-kay*. In order to account for the fact that the nominal stem *pyeng* 'bottle' satisfies one argument of the verbal stem *tta* 'open', we would have to regard the suffix *kay* as inheriting the argument structure of the verbal stem; but then the argument structure should percolate up to the whole compound, and thus we could not prevent the genitive NP *Sandy-uy* from linking to an argument of the verb stem. If we tried to prevent this by assuming the right-hand nominal stem 'opener' gets only the *R* role from its head, and the argument structure of the verbal stem is not visible there, we could not account for the fact that the nominal stem 'bottle' is interpreted as an argument of the verbal stem 'open'.

There is another fundamental problem to this structure. In such a structure, the verbal compound is regarded as a combination of two nominal stems. When we describe verbal compounds by a condition that no subject

(or external argument) appears inside a verbal compound, what is relevant is the verbal stem's subject (or external argument), not the deverbal nominal stem's. The relevant argument is not the external argument of the derived nominal such as *opener*. The derived nominal has *R* as its external argument. And it is doubtful that the noun has subject function. Whether the proper condition is a "no subject" or a "no external argument" condition, it cannot apply in this structure without complexities. Therefore, I conclude that this structure is not proper for the verbal compound.

3. "No External Argument" Condition

In this section, I will consider the argument linking inside the verbal compound in Korean. It has been observed that verbal compounds have a predicate-argument relation between the stems, and the nominal stem has been claimed to be "the first sister" (Roeper and Siegel 1978) or a "non-subject" argument (Selkirk 1982) of the verbal stem. (12) illustrates this point.

- (12) a. ai-ka mal-ul tha-n-ta.
 child-NOM horse-ACC ride-PRES-DECL
 'A child rides horses.'
- b. mal-tha-ki 'horse-riding'
- c. *ai-tha-ki 'riding by children'

3.1. Subject Inside of Verbal Compounds

What is different in Korean from English is that Korean "unaccusative" verbs may form compounds with their subject arguments, as in (13). Thus, a generalization cannot be made in terms of grammatical functions.

- (13) a. hay tot-i 'sun rise-ing (sun-rise)'
- b. tong thu-ki 'east break-ing (sun-rise)'
- c. mul kwup-i 'water bend-ing (bend in a river)'
- d. san kwup-i 'mountain bend-ing'
- e. nalssi pyenhwa 'weather change'
- f. mulka sangsung 'price go-up (inflation)'

We find similar facts in Japanese as well, as in (14).

- | | | | | |
|---------|-------------------------|--|-----------------------------|---|
| (14) a. | ame-huri
'rain-fall' | b. | hi-gure
'sun-set (time)' | |
| | c. | zi-nari
'ground-ring (sound)' | d. | muna-sawagi
'chest-make noise (worrying thoughts)' |
| | e. | ne-sagari
'price-come down (price cut)' | f. | mizu-tamari
'water-accumulate (puddle)' |
| | g. | hito-de
'people-going-out (turnout)' | h. | yama-kuzure
'mountain-collapse (avalanche)' |

These examples in (13) and (14) are treated as exceptions in the view which tries to generalize the verbal compounds in terms of grammatical functions. Sugioka (1984) notes that "the cases of [Subj V] seem to be limited to some types of natural phenomena." But, behind such an intuitional observation, there is an important fact that natural things lack volitional controllability of events, which is a crucial characteristic of the external argument.

Even though some subject argument can be inside the verbal compound, it is not true that Korean has no restriction on verbal compounding. There is no attested case of a verbal compound whose elements have an Agent-Pred relationship, as in (12)c.

3.2. Argument Structure and Verbal Compounds

I propose that Korean verbal compounds should be generalized in terms of argument structure. I adopt Grimshaw's (1990) theory of argument structure, which I will summarize briefly. The first assumption is that thematic structure is organized in accordance with the Thematic Hierarchy (Kiparsky 1987): $\langle Ag \langle Source \langle Goal \langle Instr \langle Theme \langle Loc \rangle \rangle \rangle \rangle \rangle$. The outer role is more prominent than the inner one. Second, each verb has associated with it an event structure. The event structure representing aspectual analysis breaks down events into aspectual subparts, action and state (or change of state). The argument which participates in the first sub-event is more prominent than an argument that participates in the second sub-event. Third, for an argument to be an external argument, it must be prominent both thematically and aspectually. It follows that the thematically highest role of an accusative verb cannot be the external argument (Kim 1992). This notion of external argument is quite different from Williams' (1981a) which is defined as the argument realized outside of the maximal projection of the predicate.

With Grimshaw's notion of external argument, we can distinguish between unacceptable verbal compounds and acceptable ones: while the unacceptable verbal compound in (12)c is composed of the verbal stem and its external argument, the verbal compounds in (13) and (14) each have the verbal stem's internal argument as the nominal stem. In other words, if we assume that a Korean verbal stem may combine with only its internal ar-

gument to make a verbal compound, we can correctly exclude the subject argument of unergative or transitive verbs, and allow the subject argument of unaccusative verbs inside the verbal compound. Now, we can make a generalization in terms of argument structure rather than grammatical functions.⁴

(15) No External Argument Condition:

An external argument cannot be inside of a verbal compound.

The generalization in terms of argument structure is desirable not only empirically but also theoretically. It is widely accepted that a verb has an argument structure and the grammatical functions are derived by a linking principle (eg. Lexical Mapping theory in LFG). This means that grammatical functions are not included in the lexical information of verbs and are only relevant in the syntax. Hence, verbal compounding which is a word-formation process need not (or may not) refer to a syntactic notion such as “subject”.

Grimshaw’s structured argument structure hypothesis makes a general prediction for verbal compounding, as in (16), which expresses the essence of the First Sister Principle of Roeper and Siegel (1978).

(16) If the verbal stem of a verbal compound has more than one argument, the least prominent argument appears inside the compound, and the more prominent outside.

As the thematic hierarchy defines the order in which arguments are semantically combined with their predicates, it is natural for the innermost (=least prominent) argument to combine with the verb to make a new unit and be lexicalized. This generalization predicts most cases of argument linking in Korean verbal compounds.

(17) a.	kwi-kel-i ear:Loc-hang<Ag<Th<Loc>>>-nml 'earring'	b.	sayngsen-kwu-i fish:Thm-broil<Ag<Inst<Th>>>-nml 'broiled fish'
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In (17)a and b, the verbal stem’s least prominent argument is linked to the nominal stem, Location and Theme, respectively.

Consider the verbal compound in (18) which has the same verbal stem as that in (17)b. The nominal stem is not the least prominent argument of the verbal stem.

(18) swuchpul-kwu-i
charcoal_{Inst}-broil<Ag<Inst<Th>>>-nml
'charcoal-broil'

However, this example cannot falsify the prominence theory. We could assume that the verbal stem *kwu* ‘broil’ has its Theme incorporated, and its Instrument is the least prominent argument which is to link to the nominal stem in this case. If Theme and Instrument are to be expressed at the same time, the Theme argument must appear inside the verbal compound. The reverse order of linking is unacceptable, as in (19).

- (19) *kalpi-uy swuchpul-kwu-i
 b.b.q.beef-GEN charcoal-broil-ing
 'charcoal-broiling of b.b.q. beef'

There is no case where the nominal stem is linked to the more prominent argument than an NP outside of a verbal compound. Therefore, examples such as (18) are not true counter-examples to the generalization in (16).

4. Conclusion

To sum up, I have shown that argument structure rather than grammatical function is relevant to the formation of possible verbal compounds in Korean. The nominal stem in a verbal compound is interpreted as an internal argument of the verb stem. Hence, in contrast with English, a Korean unaccusative verb constitutes a verbal compound with its argument, which would be realized as the subject in a sentence.

Based on the morphological structure where the nominal and verbal stem combine before suffixation, we can capture the distinctions between eventive verbal compounds and non-eventive ones. Regarding left-over arguments of the verb stem, we found that they can be linked to genitive NP's in eventive verbal compounds but cannot be linked in the others. An eventive suffix inherits the argument structure of the verb stem to let it percolate up to the whole compound, thereby an NP outside of a verbal compound can be interpreted as an argument of the verb stem. By inheriting the argument structure of the verb stem, a compound gets the event structure that allows it to cooccur with a duration adverbial. On the other hand, a non-eventive suffix has its own argument structure, $\langle R \rangle$, which blocks the argument structure of the verb stem from percolating up to the whole compound.

Notes

I would like to thank Paul Kiparsky, Peter Sells, Ivan A. Sag, John Rickford, Lynn Cherny, and the participants at the 19th BLS conference for their valuable discussions and comments.

¹Thematic labels such as Agent and Theme are used simply for convenience.

²It is true that most derived nouns which contain the suffix *kay* denote instruments by which agents do something to others. But when this suffix combines with a particular set of verbs (involuntary body action verbs), the derived nouns denote persons who habitually do such actions denoted by the verbal stems, as in (i). The verbal stem (*kho*)-*hulli* 'to snivel' does not have Instrument role. Thus, the *R* role of the suffix cannot be identified with Instrument. The nominal stem in (i) is linked to the least prominent argument of the verbal stem and the *R* of the suffix is identified with the external argument of the verbal stem.

(i)kho-hulli-kay
 snivel-run-nml
 'a snotty-nosed kid'

³See Cho (1992) for the phonological argument for regarding such compounds as verbal compounds. The Bindungs /s/ (obstruent-tensing) does not apply in verbal compounds.

⁴The condition in (15) is necessary for Korean verbal compounds, while English does not need this. Grimshaw correctly points out that the outermost role of the verbal stem cannot be linked to the nominal stem in the verbal compound in English, whether it is the external argument or not: **boy-reading* and **rain-falling* are equally unacceptable. A more general constraint about the relation between a modifier and modified rules out such compounds (Williams 1984, Grimshaw 1990).

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