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Structure Sharing and Argument Transfer
– An HPSG Approach to the Verbal Noun Constructions –

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Abstract

This paper presents a unification-based treatment of the "noun-verb" complex predicates in Korean and partly in Japanese which shall be called Verbal Noun Constructions. I argue that the nominal part of these complex predicates takes an argument structure of its own and that the verbal part mainly functions to derive complex predicates from these nominals. I then examine (i) how the complex argument structures of the predicates are formed, (ii) how the arguments of the nominal part are transferred to the complex predicates and distributed in the sentence, and (iii) how the grammatical function of the arguments of the nominal part is changed in the complex predicates.

For the description and explanation of these constructions I propose an analysis within the framework of Head-driven Phrase Structure Grammar (HPSG) as developed in Pollard and Sag (1987, 1994). I introduce an operation called "append" into the VAL (valence) specification of the verbal parts, an operation similar to functional composition in Categorial Grammars. I develop then a Case-marking system for Korean and some Immediate Dominance Schemata for the projection of the nouns and verbs. The rest of this paper is devoted to showing how the proposal made here can describe and explain some of the tricky issues concerning these constructions in a uniform and computationally rigorous way. Throughout this paper a unification-theoretic notion of structure sharing will be extensively used as the title of the paper suggests.

Contents

1 Introduction

In this paper I examine some aspects of the complex predicates formed by a set of nominals taking argument structures together with a set of verbs only taking null or partial argument structures. I then propose a unification-based and uniform analysis of these complex predicates within the framework of Head-driven Phrase Structure Grammar (HPSG).

In general, a complex predicate is considered to be a predicate formed out of two or more predicates. More precisely, the formation of a complex predicate is a process of combining the argument structure of one predicate with that of another. The process results in a single argument structure which functions as if it were a single lexical item. Most cases of complex predicate formation discussed in recent literature are restricted to those formed between the same categories or those formed by one category together with morphemes. These morphemes generally take their own argument structures. The formation of these complex predicates is not terra incognita in theoretical linguistics. Most proposals, Jackendoff (1974), Cattell (1984), Marantz (1984), Baker (1988) and Rosen (1989), among others, are concerned with the question of how θ-grids of complex predicates are composed and interpreted. In particular, the "noun-verb" complex predicates in Germanic and Romance languages are intensively discussed in Jackendoff (1974), Cattell (1984), Jayaseelan (1987) and Rosen (1989).

Some basic properties of the "noun-verb" complex predicates in Korean and Japanese to be discussed, however, are different from those in other languages (see 2). The proposals above do not seem to deal with some important aspects of the formation and interpretation of the "noun-verb" "complex predicates in these languages. There are also many proposals in Korean and Japanese linguistics, the majority of which are made independently of complex predicates in Germanic and Romance languages: Grimshaw & Mester's (1988) light verb and argument transfer approach, Y.-H. Kim's (1988) embedded predicate approach, H.-S. Han's (1988) verb raising approach, H.-D. Ahn's (1990) approach based on the heavy and light verb distinction, Sells' (1991) argument structure merger approach, J. Kim's (1990) incorporation approach, O'Grady's (1992) default inheritance approach and Takahashi's (1992) NP-shell approach. Unfortunately, none of them satisfactorily answer questions concerning the formation and systematic variation of these complex predicates (see sections 5 and 7 for this issue).

This paper has a two-fold purpose; one is empirical and the other theoretical. First, I aim to propose a "uniform" treatment of these "noun-verb" complex predicates in Korean and Japanese. I show that the argument structure of the complex predicates are mainly inherited from the nominal part, and the verbal part only takes a functional role as auxiliary verbs do in other languages. I then argue that the combination of these two parts is obligatory because of the sentence formation requirements in these languages. When the two parts are combined, some or all of the arguments of the nominal part are transferred to the verbal part.

Secondly, I attempt to develop a unification-based theory of argument transfer for the description of the constructions within the framework of Head-driven

Phrase Structure Grammar (HPSG), as described in Pollard & Sag (1987, in press). Following the idea of Hinrichs & Nakazawa (1993), I introduce the notion of functional composition into the valence specification of the verbal parts. The main idea undergirding my proposal is that the complex predicates are formed in such a way that those arguments which are not saturated within the maximal projection of the nominal are transferred to the functional verb. For this idea to work correctly I develop the Immediate Dominance Schemata for Korean. In all stages of the analysis the notion of structure sharing (= reentrancy or token-identity as it is often called) is extensively used.

This paper is organized as follows. In section 2, the terms of the verbal noun (VN), the functional verb (FV) and verbal noun constructions (VNCs) are introduced. In section 3, I propose an HPSG framework for the description of VNCs. I try to show how verbal nouns and functional verbs are represented in the feature structures of HPSG. The Case-marking system for Korean will also be developed in this section. In sections 4 and 5 I will show how the proposed framework describes and explains the VNCs. The argument transfer mechanism and grammatical function changing phenomena are focussed on in these sections. In section 6 I discuss some more complicated data, including incorporation of verbal nouns, lexicalized verbs and multiple verbal noun constructions. Before drawing some conclusions I compare my own proposal with some other approaches in HPSG as well as in other frameworks.

2 Verbal Noun Constructions

2.1 Three Main Issues and Previous Approaches

Korean has a highly productive sequence of strings which consist of a nominal and the verb *hata* (to do). The nominal may be optionally followed by an accusative Case-marker. The majority of the nominals followed by the verb *hata* (to do) originate in Chinese, i.e. they are Sino-Korean. Even though examples formed by non-Sino-Korean nominals are rare, there exist such examples as in (1a) in which the nominal *salang* (love) is not Sino-Korean. The resulting predicates seem to vary over four kinds of Aktionsarten, as shown (1) - (4):[1]

[1] For the transcription of Korean, we will follow The Yale Romanization System throughout this paper. When we refer to examples from other papers, we respect the original transcription system therein, however. For ease of decipherment, the verbal nouns shall be bold-faced and the functional verbs underlined.

The following abbreviations are used: TOP-topic marker; NOM-nominative Case marker; GEN-genitive Case marker; DAT-dative Case marker; and ACC-accusative Case marker; COMP-complementizer; DECL-declarative sentence marker; Q-interrogative sentence marker; IMP-imperative sentence marker; PROP-propositive sentence marker; PRES-present tense morpheme; PAST-past tense morpheme; FUT-future tense morpheme; HON-honorific morpheme; PASS-passive morpheme; CAUS-causative morpheme; INF-infinitive or [-tense] marker; PL-plural marker; NQ-numeral quantifier; ϕ-null morpheme. TOP, NOM and ACC have morphological variants depending on their phonetic environments: *nun/un*, *ka/i*, *lul/ul*. When they follow a word that ends with a vowel they are realized with the former form, otherwise, with the latter.

(1) stative predicates

a. salang(-ul) hata
love-ACC do
'to love'

b. huymang(-ul) hata
hope-ACC do
'to hope'

(2) activity predicates

a. wuncen(-ul) hata
drive-ACC do
'to drive'

b. sanchayk(-ul) hata
taking a walk-ACC do
'to take a walk'

(3) achievement predicates

a. tochak(-ul) hata
arrival-ACC do
'to arrive'

b. insik(-ul) hata
recognition-ACC do
'to recognize'

(4) accomplishment predicates

a. hoypok(-ul) hata
recovery-ACC do
'to recover'

b. tayhwa(-lul) hata
talk-ACC do
'to talk'

It is interesting to note that although *hata* (to do) is the only verb, the Aktionsarten of the predicates in (1) - (4) vary over four different kinds. An immediate question concerning the Aktionsarten is by which element they are triggered. It seems clear that the verb *hata* cannot take all of the Aktionsarten. The most plausible assumption may be that the nominals are responsible for the Aktionsarten of the predicates in (1) - (4). This assumption might be surprising since it seems to deviate from general assumptions in linguistics.

The following examples, however, suggest that the verb *hata* does not determine the number and kinds of arguments. Consider the following Korean sentences where the transitivity of the sentences - more precisely, of the predicates - varies between intr(ansitive) in (5a), tr(ansitive) in (5b) and ditr(ansitive) in (5c).[2]

(5) a. Kim-i Bill-kwa hapsek-ul ha-ess-ta. (intr.)
Kim-NOM Bill-with table sharing-ACC do-PAST-DECL
'Kim did table sharing with Bill.' = 'Kim shared table with Bill.'

b. Kim-i thongsalon-ul yenkwu-lul ha-ess-ta. (tr.)
Kim-NOM syntax-ACC research-ACC do-PAST-DECL
'Kim did research in syntax.' = 'Kim researched in syntax.'

c. Kim-i Bill-eykey silhem-kyelkwa-lul poko-ul
Kim-NOM Bill-to experiment-result-ACC report-ACC
ha-ess-ta. (ditr.)
do-PAST-DECL
'Kim did report the result of the experiment to Bill.'
= 'Kim reported...'

[2] For presentation purpose I take the Case-marked variants here. Other variants are introduced in section 5.

Note that in (5) the only verb is ha-ess-ta (did) which is an agglutinated past tense form of the verb *hata* (to do). An immediate question again is what the triggering factor for the transitivity of the example is. This question is raised due to the observation that, despite the different transitivity, each sentence has only one and the same verb *hata* (to do). Before answering the question, let us consider some Japanese counterparts to the predicates discussed above.

Japanese also abounds with similar predicates in which the verb *suru* (to do) combines with nominals. Just as in Korean, most Japanese nominals occurring in these complex predicates are Sino-Japanese.[3]

Some Japanese examples are illustrated in (6), where each one is compared with its corresponding Korean example.

(6) Japanese vs. Korean

a. kenkyuu-o suru vs. yenkwu-lul hata
research-ACC do vs. research-ACC do
'to research'

b. keikoku-o suru vs. kyengko-lul hata
warning-ACC do vs. warning-ACC do
'to warn'

c. sanpo-o suru vs. sanchayk-ul hata
taking a walk-ACC do vs. taking a walk-ACC do
'to take a walk'

d. hihan-o suru vs. piphan-ul hata
critic-ACC do vs. critic-ACC do
'to criticize'

e. hanashi-o suru vs. tayhwa-lul hata
talk-ACC do vs. talk-ACC do
'to talk'

Japanese examples such as in (6) have been extensively discussed by Grimshaw & Mester (1988, henceforth G&M). They argue that the selectional restriction for the number and kinds of arguments of the whole sentence is triggered by nouns immediately followed by the verb *suru* (to do). As evidence for that, they illustrate the examples in (7) where the full-fledged sentence in (7a) is compared with the corresponding NP in (7b).[4]

[3] Besides Korean and Japanese, Persian shows similar complex predicates formed by nominals together with verbs *kardan* (to do) and *dadan* (to do), as illustrated in (i) (cited from K. Park (1989, p.319)):

(i) a. postibani-kardan (to support)
b. nesan-dadan (to show)

[4] The postposition *-ni* may not occur before genitive Case marker *-no* in Japanese. Elsewhere, G&M (1988) have replaced it by *-e*. Thus, the sequence of *Mary-e-no* in (7b) should be understood as an expository purpose.

(7) Japanese (G&M 1988: 207)

a. John-wa Mary-ni hanashi-o shita. (= (3a), G&M 1988)
John-TOP Mary-to talk-ACC suru
'John talked to Mary.'

b. John-no Mary-e-no hanashi (= (4a), G&M 1988)
John-GEN Mary-GEN talk
'John's talk to Mary'

The example in (7b) shows that all arguments are followed by genitive Case marker -no, which indicates that they are NP-internal arguments.[5]

Based on this observation, they conclude that the selectional restriction on the number and type of arguments of the whole sentence in (7a) is not determined by the verb *suru*, but by the bold-faced nominal *hanashi* (talk).

Returning to Korean examples, the comparison of the full-fledged sentences in (5) with the corresponding NPs in (8) shows that the selectional restriction on the number and type of arguments of the whole sentence is determined by the bold-faced nominals.

(8) a. Kim-uy Bill-kwa-uy hapsek
Kim-GEN Bill-with-GEN table sharing
'Kim's table sharing with Bill'

b. Kim-uy thongsalon-uy yenkwu
Kim-GEN syntax-GEN research
'Kim's research in syntax'

c. Kim-uy Bill-eykey-uy silhem-kyelkwa-uy poko
Kim-GEN Bill-to-GEN experiment-result-GEN report
'Kim's report about the result of the experiment to Bill'

Note that in (8) the verb *hata* is not involved and that all the arguments are followed by a genitive Case marker *-uy*, which indicates that they are NP-internal arguments. Thus, it seems reasonable to assume that the transitivity is not triggered by the verb *hata* but by the nominals.

The observation made above can be summarized as follows: The properties of argument selection and Aktionsarten of these "noun-verb" complex predicates come from the nominals. This leads to issues concerning the nature of the nominals on the one hand and the verb *hata* (to do) on the other hand. For discussion purposes I will call these two issues the first and the second main issue. Other important questions are concerned with the way in which the nominals and the verb(s) are combined with each other. This issue shall be called the third main issue. In the subsequent subsections I will examine each issue more closely and propose my own approaches.

[5] To show that in (7a) all arguments are outside the object NP, they allude to the possibility of scrambling of arguments. According to them, 'the NP marked with -ni in (7a) can be placed after the NP marked with -o, giving a word order that is normal inside S but impossible inside NP, where the head Noun is always the last element' (G&M 1988: 207). As will be soon clarified, placing arguments in Korean after the object NP obviously degrades the acceptability.

2.2 The First Issue: Verbal Nouns

The discussion above suggests that the nominals being discussed must take their own argument structures. Although the nominals being discussed are Case-marked, they are not direct objects in the usual sense. The θ-frame of these nominals may be projected upwards to the sentential level. The nominals seem to take properties of nominals and verbals simultaneously.

In this subsection I will argue the dual aspect of these nominals. To state the conclusion in advance, they are categorically nouns but take argument structures of their own just as verbs do in these and other languages. As a consequence, they typically lack referentiality. Furthermore, I will argue that they are neither derived from any other category nor have any verbal counterparts in Korean. They form a distinctive class which sharply contrasts with other nominals in these languages. Following Martin (1975, 30ff.), I will call these nominals Verbal Nouns (VNs). Now I will present seven arguments to support the verbal noun assumption; they are nouns taking argument structures of their own and only VNs forms "noun-verb" complex predicates in Korean.

2.2.1 argument-taking property

The contrast in the following examples is straightforwardly borne out from the θ-role taking property of VNs. Even though both bold-faced nominals in (9) are Sino-Korean, (9b) cannot form complex predicates together with the verb *hata* (to do). The ungrammaticality of (9b) traces back to the property of *yenphil* (pencil) which does not take an argument structure, because the noun *yenphil* (pencil) is a referential noun. The example (9b) is clearly contrasted to (9a) in which *kwikwuk* (return to one's country) occurs. This noun takes an argument structure and form a complex predicate together with *hata*.

(9) a. Kim-un Korea-lo kwikwuk-ul <u>ha-ess-ta</u>.
Kim-TOP Korea-to returning-ACC do-PAST-DECL
'Kim has returned to Korea.'

b. *Kim-un (Korea-lo) yenphil-ul <u>ha-ess-ta</u>.
Kim-TOP Korea-to pencil-ACC do-PAST-DECL
'*Kim has done pencil (to Korea).'

The contrast between the examples in (9) supports the assumption that referential nouns cannot form complex predicates together with the verb *hata*.

2.2.2 attachment of aspectual morphemes

Aspectual suffixes like *cung* (during), *hwu* (after), *cen* (before), etc. can be attached to VNs as noted in Japanese by Iida (1987). These suffixes cannot be attached to referential nouns. It is not surprising if we assume that VNs take their own argument structures just as verbs do, and aspectual suffixes are attached only to the elements which take an argument structure.

(10) a. Kim paksa-ka thongsalon-ul yenkwu-cung-ita.
Dr. Kim-NOM syntax-ACC research-during-is
'Dr. Kim is (now) researching in syntax.'

b. *Kim paksa-ka (thongsalon-ul) yenphil-cung/hwu/cen-ita.
Dr. Kim-NOM syntax-ACC research-during/after/before-is
'Dr. Kim is (now) researching in syntax.'

2.2.3 no relative clause formation

VNs immediately preceding FVs lack referentiality. This characteristic is contrasted to referential nominals such as proper nouns or concrete nouns. There are two pieces of evidence which show that VNs lack referentiality. One of them is related to relative clause formation. When two nominals occur in complex predicates, only non-VN undergoes the relative clause formation as shown in (11).

(11) a. Kim-i minsok-ul yenkwu-lul <u>ha-ess-ta</u>.
Kim-NOM ethnology-ACC research-ACC do-PAST-DECL
'Kim did research ethnology.' (lit.)

b. *[[Kim-i minsok-ul $[e]_i$ <u>ha-n</u>] $[\text{yenkwu}]_i$]
Kim-NOM ethnology-ACC do-REL research
'*the research that Kim has done in ethnology'

c. [[Kim-i $[e]_i$ yenkwu-lul <u>ha-n</u>] $[\text{minsok}]_i$]
Kim-NOM research-ACC do-REL ethnology
'the ethnology that Kim has done research in'

Even though the two nominals are followed by accusative Case marker in (11a), the examples in (11b) and (11c) show that only the first nominal can undergo relative clause formation, whereas the VN cannot. This fact may be explained if we assume that, unlike referential nouns, verbal nouns take argument structures and the argument-taking nouns do not undergo relative clause formation just as verbs do not.

2.2.4 no cleft clause formation

VNs do not undergo cleft sentence formation. Based on the assumption that cleft sentence tests are often used to discern the constituenthood of a phrase, one might argue by this test that VNs may not be constituents. The constituenthood of VNs is not our direct concern here. If we take into consideration that verbs are not subject to cleft sentence tests, the contrast between the sentences in (12) may be interpreted as a suggestion that VNs are verb-like.

(12) a. *[Kim-i minsok-ul [e] <u>ha-n</u> kes]-un yenkwu i-ta
Kim-NOM ethnology-ACC do-REL that-TOP research is
'*It is research that Kim has done in ethnology.'

b. [Kim-i [e] yenkwu-ul <u>ha-n</u> kes]-un minsok i-ta.
Kim-NOM research-ACC do-REL that-TOP ethnology is
'It is ethnology that Kim has done research in.' (lit.)

2.2.5 synthetic compound formation

VNs may form synthetic compounds together with nominals as shown in (13). This property cannot be observed in non-VNs. The reason seems to be very simple: non-VNs do not take their own argument structures. This observation may be explained if we assume that only VNs take argument structures and only argument-taking nominals form synthetic compounds.

(13) a. haksayngtul-i <u>minsok</u>-ul yenkwu-lul ha-ess-ta.
students-NOM ethnology-ACC research-ACC do-PAST-DECL
'Students did research in the ethnology.' (lit.)

b. haksayngtul-i [[<u>minsok</u>-yenkwu]-lul] ha-ess-ta.
students-NOM ethnology-research-ACC do-PAST-DECL
'Students did ethnology-research.' (lit.)

c. *haksayngtul-i swuhak-ul [[<u>minsok</u>-yenkwu]-lul] ha-ess-ta.
students-NOM mathematics-ACC ethnology-research-ACC do-PAST-DECL
'*Students did ethnology-research in mathematics.'

d. *minsok-i/ul [[<u>haksayngtul</u>-yenkwu]-lul] ha-ess-ta.
ethnology-NOM/ACC students-research-ACC do-PAST-DECL
'*Ethnology did students-research in.'

The example in (13c) shows that the transitivity of the VN *yenkwu* (research) is affected through a compounding process. Whereas the VN yenkwu is transitive, the resulting compounded VN *minsok-yenkwu* (ethnology research) is intransitive. The example in (13d) shows that subject argument does not undergo a compounding process. This observation is conformed with general assumptions in morphology.

2.2.6 no attachment of determiners or demonstratives

The nominals at issue are not generally modified by determiners. This property strongly contrasts to other types of nominals like common nouns. This property seems to relate to the lack of referentiality and the verb-like peculiarity of verbal nouns. Again, the examples in (14) support the verbal noun assumptions.

(14) a. *Kim-i minsok-ul ku yenkwu-lul ha-ess-ta.
Kim-NOM ethnology-ACC that research-ACC do-PAST-DECL
'*Kim did that research in ethnology.'

b. *Kim-i Bill-kwa i hapsek-ul ha-ess-ta.
Kim-NOM Bill-with this table sharing-ACC do-PAST-DECL
'*Kim did this table sharing with Bill.'

2.2.7 modification not by adverbials, but by adjectives

The nominals at issue may be modified by adjectives as exemplified in (15). Given the general fact that adjectives only modify nominal categories, the examples in (15) suggest that the nominals being discussed are categorically nouns. The attachment of Negation adverbials *an/ani* (not) in (15c) - (15e) further supports that the nominals in question definitely take nominal category, and at the same time that they should be differentiated from other types of nominals. (see also the discussion in section 2.1)

(15) a. Seoul sicang-i simin-kwa yukhoyhan tayhwa-lul ha-ess-ta.
Seoul mayor-NOM citizen-with pleasant talk-ACC do-PAST-DECL
'The mayor of Seoul did pleasant talk with citizens.' (lit.)

b. Kim ssi-ka hayngpokhan saynghwal-ul ha-ko i-ss-ta.
Mr. Kim-NOM happy life-ACC do-SF is-PRES-DECL
'Mr. Kim is doing happy life.' (lit.)

c. *an nolki (deverbal noun)
NEG play (game)
'*not play (game)'

d. an nolki (gerundive noun)
NEG playing
'not playing'

e. *an yenkwu (verbal noun)
NEG research
'*not research'

So far, I have discussed some dual properties of VNs. Seven arguments are given to support the verbal noun assumption. Based on the discussion above, I draw a conclusion that the nominals at issue are different from other types of nominals like result nouns. They take argument structures of their own as verbs do.

In the remainder of this subsection I try to show in which way they can take argument structures. As mentioned above, the majority of these nominals are loan words from other languages – pre-dominantly from Chinese – in which they were originally verbs or verb phrases. For presentation purpose I will examine Sino-Korean nouns first, then pure Korean nouns as well as other loan words.

Unlike Korean and Japanese which are both agglutinating and verb-final (SOV as basic word order) languages, Chinese is an isolating language with an SVO word order.[6]

[6] Miyagawa (1989, p.106) claims that in Japanese all of these nominals are Sino-Japanese. Poser (1987, p.112), however, gives the examples (i) which are not composed of Sino-Japanese

Being an isolating language, Chinese has few morphological devices to transmit various grammatical features. Grammatical features are generally conveyed in isolating languages by separate words rather than morphemes, each of which carries lexical meaning or grammatical function. It is not difficult in Chinese, for instance, to discern verbal element(s) within a word or phrase. For the purpose of illustration, I assume that the following Sino-Korean nouns could be further analyzed as given on the right side of the arrow.

(16) Sino-Korean nouns and (→) corresponding Chinese word/phrase structures
  a. tayhwa 'talk' → tay#hwa ≈ each other#talk
  b. hoypok 'recovery' → hoy#pok ≈ round#recover
  c. ipmwun 'introduction' → ip#mwun ≈ enter#gate
  d. tungsan ' mountain climbing' → tung#san ≈ climb#mountains
  e. chimkong ' invasion' → chim#kong ≈ invade#attack

The corresponding Chinese word/phrase structure of the Sino-Korean nouns in (16a) and (16b) shows that in Chinese the first and second words form a modifier-verb relation. The illustration in (16c) and (16d) shows that in Chinese the second element satisfies one of the argument requirements of the second element. The internal structure of the example (16e) seems to consist of two verbs in Chinese. Unlike Chinese the lexemes of each Korean nominal on the left side of the arrow in (16) cannot be used in a separated form. This is because the two languages are typologically different. The illustration, however, shows that the Sino-Korean nouns given in (16) involve at least one verbal element in their original Chinese structures. Miyagawa (1987) makes the same observation on Sino-Japanese nouns. He argues that the nominals in productive cases of Japanese complex predicates are composed of two morphemes, at least one of which is a verbal category in the original Chinese. It is true in Korean and Japanese that nominals like those in (16) form "noun-verb" complex predicates in these languages. Thus it may not be surprising to assume that the verbal elements of original Chinese are relevant for the argument-taking property of Sino-Korean nouns.[7]

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nominals.

(i) a. tatigare suru (to be blighted)
  b. tatiuti suru (to cross swords)

[7] "(...) what looked like predicated nouns were some words that had special verbal properties (...)" (Martin (1975, p.30)). The term has been employed in various works in Japanese and Korean linguistics (Miyagawa (1987), Saiki and Cho (1987), Ahn (1990), among others). Ahn (1990) introduces the term in Korean to refer implicitly to all nominals combining with the verb *hata* (to do). There are many pieces of evidence, however, to suggest that the term may gloss over the matter. Arguments shall be given to show that not all nominals combining with the verb *hata* (to do) are verbal nouns.

This means that the Sino-Korean nouns whose corresponding Chinese structure does not involve any verbal element may not take an argument structure. For example, the Sino-Korean noun *chayksang* (desk) does not take an argument structure and does not form a "noun-verb" complex predicate (see also the examples in (9b)).

It may be important to point out that not all VNs in Korean are Sino-Korean. VNs include several loan words from other languages (e.g., `'Arbeit'` (< `arbeiten` (to work)) from German, `'drive'` from English); some pure Korean nouns (e.g., *salang* (love), *mal* (speech), *il* (work)); and Sino-Korean nouns which do not seem to have any verbal element in the internal structure of their Chinese origin (e.g., *senmwul* (present)).

Loan words from other languages do not raise any problem, since they also take an argument structure. All loan words taking argument structure form complex predicates together with *hata* (to do) in Korean. Referential nouns like computer cannot form a complex predicate together with *hata* as shown in (17c).

(17) a. drive-lul hata (`drive` from English)
b. arbeit-lul hata (`arbeit` from German)
c. *computer-lul hata (`computer` from English)

The latter two cases might be an apparent problem for the verbal noun assumption. Due to lack of space I can not examine these cases in any detail. They do not seem to raise any essential problem in the discussion in this paper, however, in that the number of pure Korean VNs and non-verbal Sino-Korean nouns occurring in the construction at issue is highly restricted. We may put this problem aside. A possible explanation could be to assume that the apparent problematic examples have undergone some morphological process such as "conversion".

There are many proposals in Korean and Japanese linguistics concerning the nature of the nominals at issue (see section 1). Among them, however, I briefly argue against Saiki & Cho's (1987) claim in order to make it clear that the verbal nouns are neither derived nouns nor deverbal nouns.

They regard the nominals at issue as deverbal nouns such as English counterparts `sale`, `play`, etc. Their starting point is that the parallelism between *yenkwu* (research) and *yenkwu-hata* (to research) corresponds to that between verbal expressions and deverbal expressions in English (cf. sell vs. sale). They try to capture this parallelism in terms of the same Grammatical Function within the framework of Lexical Functional Grammar (LFG). Their claims are contrary theory-internally to Rappaport's hypothesis of Thematic Consistency (see Rappaport (1983)). The specific LFG-theory-internal claims are not a direct concern here.

Even though they were verbs or verb phrases of Chinese origin as shown in (16)), they have no corresponding verbal counterparts in Korean. In other words, they are not derived from any other category in Korean. I will consider the similarities and differences between verbal nouns and other types of nominals on the one hand, and the similarity between process nominals and verbal nouns on the other.

Let us consider the first question. According to Chomsky (1970) the following five diagnostics serve to discern derived vs. gerundive nouns.

(18) derived nouns vs. gerundive nouns (Chomsky (1970))

a. Derived nouns are modified by adjectives; gerundive nouns are modified by adverbs, tense, aspect and negation.

b. Gerundive nouns do not pluralize.

c. Articles and demonstratives cannot be attached to gerundive nouns.

d. Gerundive nouns are in general syntactically productive.

e. Gerundive nouns are in general semantically regular.

Because of some structural and/or typological differences between Korean and English, some diagnostics in (18) may not deliver any convincing results when applied to Korean. There are no articles in Korean at all. For the same reason, the pluralization diagnostic does not seem to be apply to Korean. It is, however, generally accepted that Korean nominals like *noli* (play) and *salm* (life) are typical examples of derived nouns. Korean nominals like *nolki* (playing) and *salki* (living) are considered to be gerundive nouns. The following table show that verbal nouns sharply contrast to deverbal nouns as well as to gerundive nouns.

(19) derived nouns vs. gerundive nouns vs. verbal nouns

	derived nouns	gerundive nouns	verbal nouns
examples	*noli* (play) *salm* (life) *poki* (example)	*nolki* (playing) *salki* (living) *poki* (seeing)	*yenkwu* (research) *tayhwa* (talk) *poko* (report)
modification by	adjectives	adverbs	adjectives
determiners or demonstratives	yes	no	no
use of articles	yes (in English) not applied (in Korean)	yes (in English) not applied (in Korean)	not applied (in English) not applied (in Korean)
pluralization	yes (in English) not applied (in Korean)	yes (in English) not applied (in Korean)	not applied (in English) not applied (in Korean)
syntactic productivity	no	yes (verbs → nouns)	yes (verbal nouns → complex predicates)
semantic regularity	no	yes	yes
attachment of aspectual morphemes	not clear	no	yes
argument-taking property	no	yes	yes
cleft sentence formation	yes	no	no
relative clause formation	yes	no	no
attachment of negation adverbials	no	yes	no

The most significant thing to note is that verbal nouns are semantically regular and syntactically productive. They are semantically regular since their argument structures determine the semantic contribution of the sentence in which they occur. They are syntactically productive since the verbal counterparts are derived by attaching *hata* (to do) immediately after them. Consequently, it is clear from the comparison table above that verbal nouns are neither gerundive nouns nor derived nouns.

Another argument against Saiki and Cho (1987) is concerned with the relation between verbal nouns and their corresponding verbal forms, for instance, between *yenkwu* (research) and *yenkwu-hata* (to research). If *yenkwu* (research) were derived from *yenkwu-hata* (to research), the verb *yenkwu-hata* (to research) should undergo the same causative and passive sentence formation process as other verbs do. As will be pointed out below (see section 2.3), however, it is not the case. The point which I will advance throughout this paper is that the verb *yenkwu-hata* (to research) is derived from the verbal noun *yenkwu* (research).

On the other hand, it is generally assumed in the recent literature (Abney (1987), Grimshaw (1990), among others) that there are two kinds of nominals which are to be distinguished in terms of θ-assigning capacity. Grimshaw (1990) argues that, while nominals denoting simple objects or results only have adjuncts, nominals denoting complex events have an argument structure in the sense relevant for the θ-Criterion (Chomsky (1981)). Result and process nominals, for example, basically differ in their θ-assigning capacities, with only process nominals potentially acting as θ-assigners. Thus the assumption that some class of nominals takes an argument structure is cross-linguistically motivated. An immediate question is whether or not verbal nouns are to be identified as process nominals. Before resolving this question, let us first consider some typical differences between two types of nominals in English as pointed out by Abney (1987, p.117).

(20) a. Process nominals do not pluralize. For example, *the clipping of the grass* is a process nominal, but its plural, *the clippings*, can only be a result nominal.

b. Process nominals do not occur with demonstrative determiners. Thus, $^{?}$*that examination of the students occurred a week ago* is distinctly odd, whereas *that examination is twenty pages long* is fine.

c. Result nominals often require a determiner. **examination was ten pages long* is not possible, but *examination of the student took ten hours.*

d. Process nominals do not occur with "of NP's". The adjunct of NP's only has a concrete reading, which is incompatible with events: **the discovery of the vaccine's occurred at an opportune moment* vs. *the vaccine's discovery occurred at an opportune moment.*

Because of some structural and/or typological differences between Korean and English, the properties (20a) and (20d) are again difficult to check among Korean nominals. The distinction between the forms NP's and of NP, for instance, is not syntactically visible; both are expressed by genitive Case marker -uy. However, if one applies the diagnostics (20b) and (20c) to the nominals at issue, he may get the idea that verbal nouns are process nominals rather than result nominals. They preserve the θ-grid of a verb originating from Chinese.[8]

[8] To avoid oversimplification, however, I draw attention to the fact that the nouns under discussion can also be used in the same form as result nouns (cf. G&M (1988: 210)). The situation is basically the same as in (20) where the process noun examination cannot be phonotactically distinguished from the resultative examination. The relation between the two kinds of use is an issue which we will not attempt to address in this paper. When I refer to verbal nouns hereafter, only the process nominal use of them is discussed.

2.3 The Second Issue: Functional Verbs

Let us now consider the role and function of the verbs combined with verbal nouns. We have already observed above that the verbs *hata* (to do) and *suru* (to do) are not responsible for the Aktionsarten and transitivity of the sentences in which they occur. They, however, possess all other features normally carried by verbs in these languages. For example, morphemes like tense, aspect, honorification and sentence type, etc., may be attached to them.

Although verbal nouns take their own argument structure, they cannot form sentences without verbs like *hata/suru* (to do). Likewise, the verbs *hata/suru* cannot occur alone without some element which has θ-assigning capacity. It is an intuitively natural assumption that the combination of verbal nouns and the verbs *hata* and *suru* functions together as predicates. Verbal nouns and verbs like *hata/suru* form complex predicates in the way that their argument selection property is inherited from verbal nouns, and that other properties of these complex predicates come from the verbs. The reason why verbal nouns are required to combine with the verbs *hata/suru* (to do) may be found in the typological difference between Chinese and Korean/Japanese. Unlike Chinese predicates from which most verbal nouns originate, Korean and Japanese predicates require a verbal element to which morphemes like tense, aspect, honorification and sentence type, etc. are attached.

If we focus on the role and function of the verbs, it may be said that their function is to derive predicates from verbal nouns. There is a set of verbs which derive complex predicates from verbal nouns. The verb *hata* (to do) is only an example of these verbs. In the remainder of this subsection I will try to show that *hata* is thematically 'null' so that the argument structure of the complex predicate is inherited from that of verbal nouns without any change of grammatical function of the arguments. Besides *hata*, I will argue that in Korean at least three verbs, for instance, *sikhita* (to cause, to let), *toyta* (to be, to become) and *patta* (to get, to be given), can occur at the same position as that of *hata*.[9]

The verb *sikhita* (to cause, to let) derives causative complex predicates from verbal nouns. The verbs *toyta* (to be, to become) and *patta* (to get, to be given) derive passive complex predicates. In other words, they take only a partial argument structure of their own and change the grammatical function of the arguments of verbal nouns in the course of deriving complex predicates. This is a basic assumption which I will plead for concerning the second main issue. They are not auxiliary verbs in these languages since they do not typically combine with verbs but with nominals. They are not main verbs since they typically lack argument structures. Due to the lack of terminology I will call them functional verbs (FVs) and the assumption, the functional verb assumption. This terminology reflects two important properties of these verbs: one is their function of deriving complex predicates from verbal nouns; the other is that they change the grammatical function of the arguments of verbal nouns.

Consider the set of typical examples of the complex predicates in (21), in which the verbal noun *poko* (report) is combined with the verbs *hata* (to do), *sikhita* (to cause), *toyta* (to be) and *patta* (to get). The resulting complex predicates are an active predicate as in (21a), a causative predicate as in (21b) and passive predicates as in (21c) and (21d), respectively. The underlined verbs in (21) show a systematic variation in which, depending on the lexical meaning of each verb, the grammatical function of the arguments selected by verbal nouns is changed.

(21) complex predicates formed by a verbal noun *poko* (report)

a. poko(-lul) <u>hata</u>
report-ACC do

[9] It seems that some verbs expressing 'coming' (*ota* in Korean) and 'going' (*kata* in Korean) may combine with verbal nouns. Since these verbs may also combine with referential nouns, this kind of combination of nouns and verbs might be examined from a different point of view. Some examples are given below. I will not examine these kinds of examples in this paper.

(i) referential noun + verbs of coming and going

a. sicip-(ul) ota/kata vs. *sicip(-ul) hata
husband's home-ACC come/go
'to marry'

b. cangka(-lul) ota/kata vs. *cangka(-lul) hata
marriage-ACC come/go
'to marry'

(ii) verbal noun + verbs of coming and going

a. yehayng-(ul) ota/kata vs. yehayng(-ul) hata
trip-ACC come/go
'to go on a trip'

b. yenkwu(-lul) kata vs. yenkwu(-lul) hata
research-ACC go
'to go (in order) to research'

'to do report' (lit.) = 'to report'

b. poko(-lul) sikhita
report-ACC cause
'to cause report' (lit.) = 'to let (someone) report'

c. poko(-ka) toyta
report-NOM be
'to be done report' (lit.) = 'to be reported'

d. poko(-lul) patta
report-ACC get
'to be given report' (lit.) = 'to get a report'

Before proceeding, I will give an argument for the functional verb assumption. In Korean there are mainly two ways to form causatives and passives: morphological and periphrastic formation (see section 5 for a detailed discussion). These morphological and periphrastic causatives and passives are derived in a different way from those in (21). The verbal noun causatives and passives like in (21) build an exclusive class in which particular verbs (functional verbs in the context of this paper) are required to form causatives and passives. The verbs *sikhita*, *toyta*, and *patta* are exclusively used to derive the corresponding predicates from verbal nouns. Once the complex predicates are formed, they may further undergo multiple causative and passive formation. This observation strongly supports the verbal noun assumption.

From a syntactic point of view, the functional verbs subcategorize for verbal nouns. The following examples in (22) support the assumption that the functional verbs subcategorize for verbal nouns; it is not the reverse case.

(22) a. *salang(-i) toyta vs. salang(-ul) patta
love-NOM be vs. love-ACC get
'to be loved'

b. yenkwu(-ka) toyta vs. *yenkwu(-lul) patta
research-NOM be vs. research-ACC get
'to be researched'

The examples above show that not all verbal nouns combine with *toyta* (to be, to become) and *patta* (to get, to be given). The contrast shown in (22) suggests that verbal nouns do not subcategorize functional verbs. It is reasonable rather to assume that each functional verb subcategorizes the verbal nouns which involve a certain θ-role. As will be shown, the verb *toyta* subcategorizes verbal nouns which involve a 'THEME' θ-role in their θ-grids. On the contrary, the verb *patta* subcategorizes verbal nouns which involve a 'RECIPIENT' θ-role in their θ-grids.

Now let us focus on the functional verb *hata* (to do). The observations given in section 2.1 show that the grammatical functions between arguments of verbal nouns and the complex predicates formed with *hata* and *suru* are the same. In other words, no grammatical functions are changed in the complex predicates formed with *hata* and *suru*. Furthermore, the discussion there shows that they do not have any effect on the Aktionsarten of the predicates they form. Based on these observations, I will conclude that the verbs *hata* in Korean and *suru* in Japanese are thematically null. Their only function is to derive predicates from verbal nouns without changing any information in them. I will add one more argument from Negation data for this assumption.

In Korean, three Negation adverbials *an, ani, mos* are available. The distribution of the Negative adverb mos (cannot) is more restricted than that of *an* and *ani*, which are largely interchangeable. Leaving details aside, its meaning roughly corresponds to the English counterpart "cannot". An important feature to be noted is that the choice of the Negation adverbials is highly sensitive to the meaning of the predicates (cf. Ryu (1992) for some detailed discussions). The Negative adverb *mos* (cannot) appears in Negative sentences where the corresponding positive state of affairs is not true, against the AGENT's volition.[10]For example, verbs of perception, where the meaning is characterised by the fact that the process of perception is blind to the AGENT's volition, are only compatible with the Negative adverb *mos* (cannot). The following examples show that the ungrammaticality of the sentences is due to the incompatibility between the noun *ihay* (understanding)/*hapkyek* (pass) and the Negation adverbials *an*/*ani*.

(23) a. Kim-un [elyewun ilon]-ul ihay-lul {mos/*an/*ani}
Kim-TOP difficult theory-ACC understanding-ACC NEG
ha-ess-ta.
do-PAST-DECL
'Kim could not understand the difficult theory.'

b. Kim-un [iphaksihem]-ul hapkyek-ul {mos/*an/*ani}
Kim-TOP entrance examination-ACC pass-ACC NEG
ha-ess-ta.
do-PAST-DECL
'Kim could not pass the entrance examination.'

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[10] This relation may also be formalized as follows: "the lack of the AGENT's ability to do something" or "some external factors that prevent the corresponding state of affairs from taking place." Some further examples which belong to this class are given below (from Ryu (1992, p.39)):

(i) a. {*an / *ani / mos} kkaytatta 'realize'
b. {*an / *ani / mos} kyentita 'last, bear'
c. {*an / *ani / mos} salta 'survive'
d. {*an / *ani / mos} yucihata 'sustain'
e. {*an / *ani / mos} chamta 'endure'
f. {*an / *ani / mos} ihayhata 'understand'
g. {*an / *ani / mos} kamcihata 'sense'
h. {*an / *ani / mos} hapkyekhata 'pass (the examination)', etc.

Since the verb *hata* (to do) is compatible with all three Negation adverbials, the ungrammaticality of the sentences can not be attributed to the relation between *hata* (to do) and *mos* (cannot). The only possible explanation for the selection of the Negation adverbial *mos* (cannot) in (23) is that the meaning of *ihay* (understanding) is not compatible with the other two adverbials. This implies that the two NPs in (23) are the dependants of the noun *ihay* (understanding). At the same time, the examples in (23) show that the verb *hata* (to do) does not take any arguments itself. Thus, the verb hata is thematically null.

Before discussing the third main issue, I will argue that the verb *hata* (to do) is different from the typographically same predicate *hata* (to be) illustrated in (24). It is important to note that the following examples are not complex predicates derived from verbal nouns. The examples below differ not only syntactically but also semantically from the complex predicates discussed so far. Based on the following observations, I will exclude this kind of complex predicates from those in verbal noun constructions.

(24) Case-marked forms vs. non-Case-marked forms vs. dependence

a. *swuncin-i/ul hata vs. swuncin hata vs. swuncin
naiveté-NOM/ACC do vs. naiveté do
'to be naive'

b. *kyemson-i/ul hata vs. kyemson hata vs. kyemson
modesty-NOM/ACC do vs. modesty do
'to be modest'

c. *cinci-ka/lul hata vs. cinci hata vs. cinci
earnesty-NOM/ACC do vs. earnesty do
'to be earnest'

d. *thatang-i/ul hata vs. thatang hata vs.
appropriateness-NOM/ACC do vs. appropriateness do
thatang

'to be appropriate'

First of all and most importantly, Case-markers can never intervene between them and the resulting complex predicates are not verbs but typically adjectives.

Secondly, complex predicates as in (24) do not show any grammatical function changing of the arguments. The nominal part of (24) does not combine with *toyta* (to be) and *sikhita* (to cause, to let).

(25) a. *swuncin-sikhita vs. *swuncin-toyta
naiveté-cause vs. naiveté-be

b. *kyemson-sikhita vs. *kyemson-toyta
modesty-cause vs. modesty-be

c. *cinci-sikhita vs. *cinci-toyta
earnesty-cause vs. earnesty-be

d. *thatang-sikhita vs. *thatang-toyta
appropriateness-cause vs. appropriateness-be

Thirdly, the complex predicates like in (24) do not undergo progressive sentence formation. This property is typically observed in adjectives in Korean.

(26) progressive sentence formation

a. *ku ilon-un thatang-ha-ko i-ss-ta.
that theory-TOP appropriateness-do-SF be-PRES-DECL
'The theory is being appropriate.'

b. *Kim-un swuncin-ha-ko i-ss-ta.
Kim-TOP naiveté-do-SF be-PRES-DECL
'Kim is being naive.'

c. *Kim-un kyemson-ha-ko i-ss-ta.
Kim-NOM modesty-do-SF be-PRES-DECL
'Kim is being modest.'

Fourthly, complex predicates as in (24) have neither a proposal sentence form, nor a imperative sentence form. This observation seems to be related to the general differences between adjectives and verbs in Korean.

(27) imperative and proposal form of (24a) and the adjective yepputa (pretty)

a. *swuncin-ha-yela! '*Be naive!' (imperative form of (24a))
naiveté-do-IMP

b. *swuncin-ha-ca! '*Let's be naive!' (proposal form of (24a))
naiveté-do-PROP

c. *yeppu-ela! '*Be pretty!' (imperative form of yepputa (pretty))
pretty-do-IMP

d. *yeppu-ca! '*Let's be pretty!' (proposal form of yepputa
pretty-do-PROP
(pretty))

All the observations made above seem to suggest that the complex predicates in (24) are adjectives. Since complex predicates as in (24) deviate from those formed by VNs and since the description of the adjectival complex predicates are not of direct concern in this paper, I will not try to analyse this kind of adjectival complex predicates. But it is important to note that one should distinguish them from the complex predicates derived from verbal nouns. For this purpose, the nominal parts of the predicates in (24) may be called adjectival nouns (ANs) – following Martin (1975) – and the resulting complex predicates adjectival complex predicates.[11]

[11] It has been suggested in most analyses that the Case-marked variants are phrasal and should be treated by syntactic rules in syntax (e.g. Syntactic Incorporation (Ahn 1990), Verb

There have been two claims concerning the nature of the verbs like *hata/suru*: G&M's (1988) light verb and Ahn's (1990) heavy verb. G&M (1988: 205) claim that the Japanese verb *suru* is thematically incomplete or light. According to them it subcategorizes and Case-marks a direct object NP without assigning it a θ-role. Ahn's (1990) arguments contrast to G&M's (1988) with respect to some theory-internal issues like Case-assigning and θ-role assigning property. I will not discuss here this kind of theory-internal issue (see section 7). Note, however, that these two claims are restricted only to the verb *hata* and its Japanese counterpart *suru*. They do not notice that the verbs *hata/suru* are only an instance of the verbs which I call functional verbs.[12]

A terminology might not be important. It is important, however, to note that not all the verbs combining with verbal nouns are thematically incomplete or light. The verb *hata/suru* is thematically 'null' and another verb like *sikhita* (to cause, to let), for instance, has a thematic role to be assigned subject. One might miss the point if one calls all these verbs light or heavy verbs.

2.4 The Third Issue: Argument Transfer and θ-Theory

The complex predicate formation is generally considered to be a process of combining the argument structure of one predicate with those of others. We have argued in section 2.2 that verbal nouns and functional verbs form complex predicates in the way that their property for argument selection is basically inherited from verbal nouns. We have not examined how the property of argument selection is inherited. I discuss this in this subsection.

Consider first some similar constructions in other languages. We see in (28) the so-called deverbal noun constructions in English. It has been observed that there are significant parallels between sentences like (28a) and those in (28b). In both examples, the arguments bear the same thematic relations to the verb blame in (28a) as to the deverbal noun blame in (28b) in which the deverbal noun heads the direct object of the main verb put.

(28) Jackendoff (1974, p.481): `blame`-type nominals and complex predicates
  a. Mary blamed John for the accident.
  b. Mary put the blame on John for the accident.

Many proposals have been made to capture the parallel thematic relations of the two alternatives. Jackendoff (1974), for example, proposes a rule he calls "Complex Predicate Rule" (CPR). The basic idea therein is that CPR combines the

Raising (Han 1988)). The non-Case-marked variants are dealt with as single words, whether they are lexically derived (e.g. Ahn (1990), Miyagawa (1987), etc.) or derived in syntax. According to Rosen (1989), the same properties as VNCs are observed also in Restructuring Constructions in Romance languages.

[12] In Japanese, causatives and passives are not formed in the same way as in Korean. They are derived by attaching the morphemes *-sase* and *-rare* to the verbal stem or verbal noun stem, respectively. Because Japanese does not show the same variation among active, causative and passive complex predicates as in Korean, any approach developed for Japanese might be restricted only to one type of the Korean complex predicates, namely to the *hata*-type.

subcategorization frame of the verb and that of the deverbal noun and merges them into one subcategorization frame stated in the form of a verb. Cattell (1984) takes up the formation of complex predicates in terms of his "Lexical Redundancy Rule" (LRR). Leaving the details aside, LRR says that if the selection of the verb is marked in the lexical entry of the deverbal noun, the string of the marked verb and the deverbal noun constitute a complex predicate. Obvious parallel constructions are also observed in languages other than English. Jayaseelan (1987) discusses the deverbal noun constructions in Malayalam (a Dravidian language spoken in southern India) as given in (29).

(29) Malayalam (1987, p.92)

a.

raaǰaaw∂	mantRi-ye	pookuwaan	anuwadicc-u.
King-NOM	minister-ACC	go-INF	permit-PAST

'The king permitted the minister to leave.'

b.

raaǰaaw∂	mantRi-k̇k̇	pookuwaan	anuwadam	kodutt-u.
King-NOM	minister-DAT	go-INF	permission-ACC	give-PAST

'The king gave permission to the minister to leave.'

Jayaseelan (1988) proposes a mechanism he calls "Argument Promotion". The underlying idea of the Argument Promotion is that unsaturated arguments, if any, must be inherited upwards. If there is an argument role intersecting two different θ-frames, this role must be counted as one role in the complex argument structure. This is the same operation as union in set theory.

As the difference between verbal nouns and deverbal nouns suggests, there are many phenomena which show that complex predicates derived from verbal nouns should be treated in a somewhat different way. I will discuss below why the proposals just introduced may face difficulties in describing complex predicates derived from verbal nouns. I then present my own proposal in how to treat them.

First, Jackendoff's CPR may not capture one of the important properties of complex predicates being discussed. The formation of complex predicates from verbal nouns is not a simple combination or merging of the subcategorization frames of functional verbs and verbal nouns. As the examples in (30) show, some of the arguments of verbal nouns may be realized within the maximal projection of the verbal noun. Consider the following examples in which the THEME argument of the verbal noun *penyek* (translation) can be realized either within NP as in (30a) or at the sentence level as in (30b).

(30) a.

Kim	paksa-ka	ku	chayk-uy	penyek-ul	ha-ess-ta.
Dr.	Kim-NOM	the	book-GEN	translation-ACC	do-PAST-DECL

'Dr. Kim did translation of the book.'

b.

Kim	paksa-ka	ku	chayk-ul	penyek-ul	ha-ess-ta.
Dr.	Kim-NOM	the	book-ACC	translation-ACC	do-PAST-DECL

'Dr. Kim did translation of the book.'

Any approach simply to combine two subcategorization frames of the verbal noun and the functional verb may not cover examples like (30a). Moreover, depending on the functional verb the grammatical function of the arguments of verbal nouns is changed, as discussed above.

(31) a. Kim-i [Mozart-uy kyohyangkok]-ul yencwu-lul ha-ess-ta.
Kim-NOM Mozart-GEN symphony-ACC play-ACC do-PAST-DECL
'Kim did playing Mozart's symphony.' (lit.)

b. Lee-ka Kim-eykey [Mozart-uy kyohyangkok]-ul yencwu-lul
Lee-NOM Kim-to Mozart-GEN symphony-ACC play-ACC
sikhi-ess-ta.
make-PAST-DECL
'Lee cause Kim to do playing Mozart's symphony.' (lit.)

c. [Mozart-uy kyohyangkok]-i (Kim-eyuyhay) yencwu-ka
Mozart-GEN symphony-NOM Kim-by play-NOM
toy-ess-ta.
be-PAST-DECL
'Mozart's symphony was played (by Kim).' (lit.)

As is generally the case, the causative complex predicates like in (31b) take one more argument than the verbal noun *yencwu* (play) takes. Passive complex predicates like in (31c) take one less argument than the verbal noun *yencwu* (play) takes. Thus the simple combination of the two argument structures may not correctly explain the grammatical function changing phenomena.

Secondly, Cattell's LRR may be redundant. Since the complex predicates derived from verbal nouns show systematic variation among active, causative and passive predicates, we need not mark the selection of the verb in the lexical entry of the verbal nouns. In other words, complex predicates derived from verbal nouns are highly regular and productive. In most cases, on the contrary, English complex predicates show a high degree of lexicalization. Furthermore, as argued in subsection 2.2, not the verbal nouns but the functional verbs select a certain verbal noun which they combine with.

Thirdly, Jayaseelan's proposal, "Argument Promotion", basically suggests a correct solution for the complex predicates being discussed. But his proposal may not capture any generalization about the grammatical function changing phenomena as illustrated in (31). On the other hand, it is not clear in his approach how the so-called locality condition is satisfied.

Given the fact that all arguments are selected by verbal nouns in the complex predicates being discussed, one of the important issues is how the arguments occurring at the sentence level are θ-marked. The issue is known as the locality condition. This condition reflects the fact that there is no language we know of where verbs assign Case or θ-roles to some NP which is lexically selected by one of their complements. The reversed cases would also result in the violation of the locality condition. Moreover, NPs are generally thought to be incapable of assigning any selectional restriction to some other NP occurring outside their local domain. Thus, θ-marking is defined, for instance, in PPT (Chomsky 1981) under the sisterhood condition (cf. θ-Criterion in this theory).[13] Many analyses are proposed in Korean and Japanese linguistics. One of the questions concerning this issue seems to be how some or all of the arguments of the nominal may be realized at the sentence level as well as within the maximal projection of the noun. G&M's (1988) argument transfer approach (only for Japanese) is an attempt to explain this aspect of the complex predicates. If all arguments of the nominal are realized at the sentence level, the same Case markers occur repeatedly at the sentence level. It is not surprising that the complex predicates being examined are sometimes called "Multiple Complement Constructions" or "Multiple Accusative/Nominative Constructions". This question is focussed on in Y.-H. Kim's (1988) embedded predicate approach (only for Korean) and O'Grady's (1992) default inheritance approach. Some theory-internal alternatives to G&M (1988) are proposed within the Principles and Parameter Theory (Chomsky 1981, 1986) in H.-S. Han's (1988) verb raising approach, J. Kim's (1990) Incorporation Approach (only for Korean) and Takahashi's (1992) NP-shell approach (only for Japanese), to name a few.

My own claim on the third main issue is similar to that of Jayaseelan (1988) and of G&M (1988). The complex predicates are formed in such a way that those arguments which are not saturated within the maximal projection of the verbal noun must be transferred to the functional verb. They are not formed by directly combining or merging two argument structures of verbal nouns and functional verbs. Some important differences between my approach and G&M's will be given below when we discuss data in detail. Some selected issues which are not raised in this section but examined in subsequent sections are listed below.

- Case-marking of verbal nouns (section 3.4): verbal nouns are optionally Case-marked. As a careful reader may already notice, accusative and nominative Case are assigned to them in the active and passive complex predicates, respectively. It should be clarified by which element and how the verbal noun is Case-marked.

- Incorporation of verbal nouns and modifier-mismatching (section 4.2): As shown in subsection 2.2, verbal nouns may be modified by adjectives in general. When verbal nouns are incorporated into the functional verbs, however, only adverbials (instead of adjectives) can precede the complex predicates.

- Hierarchy of arguments (section 4): We have assumed and argued that some or all of the arguments of verbal nouns are transferred to the functional verbs. When only some of them are transferred to the functional verbs, a question is raised as to which argument may be transferred to the functional verbs and which argument may not be. This question also deals with which argument must be transferred. I will argue that there is a hierarchy between arguments to be transferred.

[13] It seems to be exceptional that subject is assigned a θ-role compositionally by a verb phrase.

- Multiple occurrence of complements (section 6.4): If all arguments of the verbal noun are realized at the sentence level, more complements than are required by verbs occur in the sentence. They may be also Case-marked. Thus, this question seems to be related to the Case-marking problem. I will try to show that the multiple occurrence of complements is a mere phenomenon in which the argument transfer repeatedly takes place from the embedded verbal nouns.

- Ergative verbal nouns (section 6.3): Ergative verbal nouns cast interesting questions concerning Case-marking and derivation of passive predicates. For example, Miyagawa (1989) claims that they cannot be Case-marked in Japanese. Korean Ergative verbal nouns behave differently. My own analysis will be proposed below and draws some theoretical consequences from them.

To conclude this section I will clarify the term "verbal noun constructions" (VNCs). VNCs are constructions which consist of verbal nouns and functional verbs. They are complex predicates which vary systematically over active, causative and passive predicates depending on the functional verb. The arguments of the complex predicates are basically inherited from verbal nouns, but not all arguments are inherited. In the next section I further advance these ideas and try to show how we can incorporate them within the Head-driven Phrase Structure Grammar.

3 An HPSG Framework for Verbal Noun Constructions

In this section, an HPSG theory of VNCs is developed. After the introduction of some theoretical fundamentals of HPSG, I will propose an argument transfer mechanism based on the fine-grained lexical specification of FV and the Immediate Dominance Schemata. Two crucial features of the proposal are the introduction of functional composition into the lexical entry of FV and the separation of Case-marking information from the lexical entry of a VN and an FV.

3.1 Basic Tenets of Feature Structures in HPSG

The Head-driven Phrase Structure Grammar (HPSG) is a grammar formalism which belongs to the family known as the Unification Grammars.[14]

[14] One can note some significant theoretical extensions and modifications among the versions of the theory known as Head-driven Phrase Structure Grammar (HPSG). In this paper we sometimes call the theory presented in P&S (1987) and P&S (in press, chapters 1-8) HPSG 1 and HPSG 2, respectively. In particular, the theory described in P&S (in press, chapter 9) shall be referred to as HPSG 3.

As in other unification-based grammar formalisms, feature structures are used in HPSG to represent linguistic information of various types of phonological, semantic and syntactic information relating to linguistic objects. As a notational convention we adopt the attribute value matrices (AVMs) rather than the directed acyclic graphs (DAGs) or the path notations.

In HPSG, feature structures are specified recursively. In other words, linguistic objects are modelled via complex feature structures which may again have complex internal structures of their own, etc. Each feature structure is labelled with a "sort", which indicates what type of linguistic object is being modelled. The most basic "sort" of information is the sign which incorporates at its top most level a list of phoneme-strings (PHON), a bundle of syntactic categories and semantic information (SYNSEM), and constituent structure specifications (DTRS).[15]

A top level feature structure is illustrated as in (32) (italicized letters indicate sortal information).

(32)
$$
{}_{\textit{sign}}\begin{bmatrix} \text{PHON} & \textit{list(phomene\_strings)} \\ \text{SYNSEM} & \textit{synsem} \\ \text{DTRS} & \textit{constituent\_structure} \end{bmatrix}
$$

Our main interest is the internal structure of the SYNSEM feature. One of the sorts incorporated in SYNSEM is a sort category, which has in turn feature structures HEAD, VAL, LEX and possibly MARKING, as shown in (33). LEX and MARKING will be clarified below at the relevant subsection.

(33) specification of the sort *category* (preliminary version)
$$
{}_{\textit{category}}\begin{bmatrix} \text{HEAD } \textit{head} \\ \text{VAL } {}_{\textit{val}}\begin{bmatrix} \text{SUBJ } \textit{list\_of\_length-1 (synsem)} \\ \text{COMPS } \textit{list (synsem)} \end{bmatrix} \\ \text{MARKING } \textit{marking} \\ \text{LEX } \textit{boolean} \end{bmatrix}
$$

The value of the feature HEAD is again a feature structure whose sort is head. Roughly speaking, the feature HEAD specifies part-of-speech information of the lexical item in question. Some parts-of-speech have their own feature specifications. For example, nouns can be further specified by a feature CASE [*nom*].

The value of VAL, which stands for valences, is a specification of the number and kind of arguments. What is actually specified in the VAL value is the SYNSEM value of the complements. The sort val is further specified by the features SUBJ (for subject) and COMPS (for complements). A notational assumption is that complements in COMP are ordered in a list, within which the relative position is intended to reflect some version of the traditional notion of obliqueness

[15] It should be noted that the attributes given in (32) are not an exhaustive list of top level features. Specifications of quantifier interpretation (QSTORE and RETRIEVED), for example, could be added. Those who may not be familiar with the general property of the feature specifications assumed in HPSG are referred to P&S (1987, in press).

hierarchy.[16]

If there are more than two complements besides the subject, I will represent COMPS adopting a Prolog-style notation as in (34a). The aim in adopting this notation is to distinguish the direct object from other complements. If there is only one object, it is represented as in (34b).

(34) a. COMPS <direct object | other more oblique complements>
b. COMPS <direct object>

It should be noted that, unlike HPSG 1 and 2, the subject complement is distinguished from other complements such as direct or indirect objects. We will represent this notion as a separate feature SUBJ. Proposals for the distinction between subject and other complements have been made – most notably – by Borsley (1987).[17]

Borsley's arguments for such a distinction include: (i) observations in unbounded dependency constructions, (ii) the notion of natural class between verb phrases and sentences, (iii) problems noted in non-predicative prepositions such as on in depend on in English, and (iv) the undesirable treatment of subject extraction in HPSG 1. Richard Cooper (1990: 2) and P&S (in press: 413) supply further evidence for Borsley's proposal. Since in the process of argument transfer subject complement shows a special status, it will be distinguished from other complements in terms of a separate feature in this paper

The specifications of HEAD and VAL for phrases are subject to two Universal Principles, the Head Feature Principle and the Valence Principle.

(35) Head Feature Principle (HFP)

$$\begin{bmatrix}\text{DTRS}\ {}_{\textit{headed-structure}}[\ \ ]\end{bmatrix} \Longrightarrow \begin{bmatrix}\text{SYNSEM}\,|\,\text{LOC}\,|\,\text{CAT}\,|\,\text{HEAD}\ \boxed{1}\\ \text{DTRS}\,|\,\text{HEAD-DTR}\,|\,\text{SYNSEM}\,|\,\text{LOC}\,|\,\text{CAT}\,|\,\text{HEAD}\ \boxed{1}\end{bmatrix}$$

The HFP in (*35*) constrains the flow of HEAD features; the value of the HEAD feature of any headed phrase is unified with the value of the HEAD feature of its head daughter. The boxed integer $\boxed{1}$ indicates that the two paths share one and the same feature structure as their value. This mechanism is called structure sharing and will be intensively used in this paper.[18]Now, let us turn

[16] According to P&S (1987: 117ff), the hierarchical notion of subcategorization can capture at least four generalizations. They involve ordering generalizations in English, generalizations in the theory of control, generalizations about the binding of pronouns and reflexives, and generalizations regarding the functioning of lexical rules.

[17] See Cooper (1990), Pollard (1989) and P&S (in press: chapter 9) for a discussion on some advantages of this assumption over the standard assumption in HPSG 1 and 2.

[18] The notion of structure sharing should not be confused with structure identity. The notion of ≫structure sharing≪ is understood as "token identity between substructures of a given structure in accordance with lexical specifications, grammatical principles or complex interactions of the two" (P&S (in press: viii)). Thus, structure-sharing means not only values which are structurally identical feature structures (= type-identity or structure-identity), but also token identity of values.

to the Valence Principle (VLP). This principle works in a similar way to the cancellation or the functional application in Categorial Grammar. The VLP says that in a headed phrase, for each valence feature F, the F value of the head daughter is the concatenation of the phrase's F value with the list of SYNSEM values of the F-DTRS value (P&S (in press): 462). This idea may be represented as follows (elist stands for empty list).

(36) The Valence Principle (VLP)

$$\begin{bmatrix}\text{DTRS}\ {}_{\textit{headed-structure}}[\ ]\end{bmatrix} \quad\Longrightarrow$$

$$\begin{bmatrix}\text{SYNSEM}\,|\,\text{LOC}\,|\,\text{CAT}\,|\,\text{VAL} & \begin{bmatrix}\text{SUBJ} & \textit{elist}\\ \text{COMPS} & \boxed{3}\end{bmatrix}\\ \text{DTRS} & \begin{bmatrix}\text{HEAD-DTR}\,|\,\text{SYNSEM}\,|\,\text{LOC}\,|\,\text{CAT}\,|\,\text{VAL} & \begin{bmatrix}\text{SUBJ} & \boxed{1}\\ \text{COMPS} & \left\langle \boxed{2}\ |\ \boxed{3}\right\rangle\end{bmatrix}\\ \text{SUBJ-DTR}\,|\,\text{SYNSEM}\ \boxed{1} & \\ \text{COMP-DTRS}\,|\,\text{SYNSEM}\ \boxed{2} & \end{bmatrix}\end{bmatrix}$$

The notion of 'subcategorization' in HPSG, encoded in the features VAL and CONTENT (see below), is an integrated one by nature. It incorporates not only restrictions on the number and kind of arguments and their associated grammatical relations, but also category selection, Case and agreement specifications and semantic role assignment. For expository purposes, let us consider a somewhat simplified version of the feature structure for the transitive verb hits in (37) (irrelevant details are omitted).

(37) a simplified lexical entry for the verb *hits*

$$_{\textit{word}}\begin{bmatrix}\text{PHON}\ /\text{hits}/ & \\ \text{SYNSEM} & _{\textit{synsem}}\begin{bmatrix}\text{LOC} & _{\textit{loc}}\begin{bmatrix}\text{CAT} & _{\textit{cat}}\begin{bmatrix}\text{HEAD} & _{\textit{verb}}\begin{bmatrix}\text{VFORM}\ \textit{fin}\end{bmatrix}\\ \text{VAL} & _{\textit{val}}\begin{bmatrix}\text{SUBJ} & \left\langle \boxed{3}\ \text{NP}[\textit{nom}]_{\boxed{1}[\textit{sg, 3rd}]}\right\rangle\\ \text{COMPS} & \left\langle \text{NP}[\textit{acc}]_{\boxed{2}}\right\rangle\end{bmatrix}\end{bmatrix}\\ \text{CONTENT}\ \boxed{4} & _{\textit{psoa}}\begin{bmatrix}\text{RELATION} & \textit{hit}\\ \text{AGENT} & \boxed{1}\\ \text{THEME} & \boxed{2}\end{bmatrix}\end{bmatrix}\end{bmatrix}\end{bmatrix}$$

The verb hits selects two NP arguments, subject and object, in which Case information is specified. The lexical entry (37) also involves agreement specification between the subject argument and the verb. Semantic contributions, including thematic roles, are represented as a value of the CONTENT attribute; its sortal name is a *parametrized state-of-affairs* (*psoa*). For the sake of simplicity, we will use the following abbreviation for the structure in (37) if necessary.

(38) abbreviation for the lexical entry in (37)

$$\text{V}\begin{bmatrix}\text{NP}_{\boxed{1}}\ \left\langle \text{NP}_{\boxed{2}}\right\rangle\end{bmatrix}:\boxed{4}$$

The basic semantic body in HPSG including psoa is inspired by Situation Theory and Situation Semantics (Barwise and Perry (1983), Devlin (1991)), where 'meaning' is analyzed as a relation between different situation-theoretic objects. The relation 'hit' holds between two individuals – one to hit and the other to be hit. It is repeatedly argued that in this sense the exact specification of argument roles is not necessary in HPSG. Note that my approach in specifying particular roles such as AGENT, THEME, GOAL, etc. in CONTENT differs from the standard notation of thematic roles in HPSG. One motivation for this is the passive variation of VNCs, where some passive functional verbs select a restricted class of verbal nouns which have particular thematic roles. The role names, however, should not be identified with case-roles in the sense of Fillmore or Gruber, nor with thematic roles in the Principles and Parameter Theory (PPT). The CONTEXT feature, together with the CONTENT feature, describes the semantic and pragmatic contribution of lexical items. They provide a parameter which is restricted by a set of conditions given as a value of RESTR (for restrictions) in CONTENT and as BACKGROUND in CONTEXT. To avoid digression, I will not go into the CONTENT and CONTEXT value (see P&S (in press: Ch. 1) for the introduction of these notions).

3.2 Representation of Verbal Nouns

In HPSG the semantic contribution of nouns is different from that of verbs. Accordingly they are specified in a somewhat different way. Syntactically speaking, there are only two classes of nouns, i.e. saturated and unsaturated ones. Proper nouns and common nouns are typical examples of saturated and non-saturated nouns, respectively. Common nouns must be saturated by some element like a determiner or a possessor phrase. P&S (in press) propose an HPSG version of X-bar theory, called a lexically based X-bar theory, in which the feature VAL is further extended to three features: SUBJ, COMPS and SPR (for specifier). The basic idea is that 'the lexicon provides us with words whose requirements for selected dependants are given by their valence features'. A sample lexical entry for common nouns can be represented within the lexically based X-bar theory as follows:

(39) a sample lexical entry for a common noun *sacin* (photograph)

$$ {}_{\textit{word}}\begin{bmatrix} \text{PHON /sacin/} \\ \text{SYNSEM} \begin{bmatrix} \text{LOC} \begin{bmatrix} \text{CAT} \; {}_{\textit{cat}}\begin{bmatrix} \text{HEAD } \textit{noun} \\ \text{VAL} \; {}_{\textit{val}}\begin{bmatrix} \text{SUBJ} & \textit{elist} \\ \text{SPR} & \left\langle \boxed{2}\ \text{DetP} \right\rangle \\ \text{COMPS} & \textit{elist} \end{bmatrix} \end{bmatrix} \\ \text{CONTENT} \; {}_{\textit{npro}}\begin{bmatrix} \text{PRM } \boxed{1} \\ \text{RESTR} \left\{ \begin{bmatrix} \text{RELATION} & \text{photograph} \\ \text{INSTANCE} & \boxed{1} \end{bmatrix} \right\} \end{bmatrix} \end{bmatrix} \end{bmatrix} \end{bmatrix} $$

The VAL specification in (39) shows that the noun *sacin* (photograph) requires only a specifier phrase which can be occupied by a determiner or a possessor phrase. It is clear in the foregoing discussion that verbal nouns are semantically and syntactically different from referential common nouns like *sacin* (photograph) as well as gerundive or deverbal nouns (see (19) in section 2.2 for a summarization of the differences). The specification in (39) is characterized by the fact that they are basically referential nouns. This is easily seen on the specification by the fact that the specification typically introduces a referential parameter (abbreviated as PRM).

In the remainder of this subsection I will specify verbal nouns along the line that they are nominal category, but there are strong parallels between verbal nouns and verbs in general. I will discard the specification of the referentiality on behalf of the argument-taking property of verbal nouns. One significant change then may be the specification of CONTENT attribute, i.e., it should not introduce a referential parameter, PRM, but a *parametrized state-of-affairs* (*psoa*). What we in turn should set forth includes whether the subject argument of verbal nouns is specified as SUBJ or SPR, and what the subsort of HEAD specification for verbal nouns is.

Let us consider the first question. P&S (in press, Ch. 9) argue that specifiers including possessives are not subjects, with the proviso that this holds at least for English and German. They give several arguments to distinguish between SUBJ and SPR (see P&S (in press: 422ff)). For example, specifiers cannot be semantic arguments. Furthermore, the specifier position seems unavailable for obligatory control as the subject position is, nor is raising of specifiers to an argument position of a higher predicate possible.

Contrary to P&S' (in press) treatment of possessives in English, I will treat the subject argument of verbal nouns as SUBJ, not SPR. The most important motivation for this is that the arguments of a verbal noun are semantically regular like those of verbs. Agreeing with Abney (1987) that the verbal θ-grid is only preserved in process nominals (and not in result nominals), we can conclude that the subject of verbal nouns should be specified as SUBJ. Thus, the requirements for dependants of a verbal noun are specified in terms of their valence features SUBJ and COMPS. Another reason for the choice of SUBJ rather than SPR comes from the need to distinguish verbal nouns from other kinds of nominals such as result nominals and other common nouns. For these the SPR attribute is specified. Thirdly, the subject of verbal nouns can freely be raised to an argument position of a higher predicate (cf. the examples in section 2).

Let us consider the second question, i.e. what the subsort of the HEAD specification for verbal nouns is. As discussed in section 2, verbal nouns reveal a lot of peculiarities which are not observed with other types of nominals. The most remarkable property of verbal nouns is that despite their categorial nature as nouns, they are verb-like. One might attempt to represent verbal nouns as an independent subsort of the HEAD; there would then be verbal nouns, nouns, verbs, adjectives, etc. as parts-of-speech. The most undesirable subsidiary effect then would be that all adjectives would need to be specified disjunctively, since verbal nouns can be modified by adjectives just as non-verbal nouns can. I will not pursue this line of reasoning further, since the whole grammatical system would be unnecessarily complicated. Instead, I will capture the verbal property of verbal nouns with two modifications. I will introduce a Boolean feature PRED, which stands for PREDICATE, in the specification of HEAD feature. The second step in coping with the verbal properties of verbal nouns is the specification of CONTENT, as in feature structures for verbs (cf. (37)). I will propose the following structure as a lexical representation of verbal nouns like *yenkwu* (research).

(40) a lexical representation of verbal nouns (preliminary version): *yenkwu* (research)

$$
{}_{word}\left[\begin{array}{ll}
\text{PHON} & /\text{yenkwu}/ \\
\text{SYNSEM} & {}_{synsem}\left[\begin{array}{ll}
\text{LOC} & {}_{loc}\left[\begin{array}{ll}
\text{CAT} & {}_{cat}\left[\begin{array}{ll}
\text{HEAD} & {}_{noun}\left[\text{PRED} \quad +\right] \\
\text{VAL} & {}_{val}\left[\begin{array}{ll}
\text{SUBJ} & \left\langle \left(\text{NP}_{\boxed{1}}\right) \right\rangle \\
\text{COMPS} & \left\langle \text{NP}_{\boxed{2}} \right\rangle
\end{array}\right]
\end{array}\right] \\
\text{CONTENT } \boxed{3} & {}_{psoa}\left[\begin{array}{ll}
\text{RELATION} & \textit{research} \\
\text{AGENT} & \boxed{1} \\
\text{THEME} & \boxed{2}
\end{array}\right]
\end{array}\right]
\end{array}\right]
\end{array}\right]
$$

We assume that, unlike in the specification of verbs, the value of the SUBJ attribute of verbal nouns is optional. In recent literature (Grimshaw (1990), among others), it is proposed that nominal argument structure differs from verbal argument structure in that the external argument of nouns is suppressed by the same process that makes the external argument optional in passive constructions (see Szabolcsi (1992) for arguments against Grimshaw's proposal). My proposal in (40) may not be directly compared with Grimshaw (1990), since the specification in (40) is restricted to verbal nouns. The most significant effect of the specification in (40) is demonstrated in the construction in (41) in which more than one verbal noun occur in one sentence, a construction which shall be called 'multiple verbal noun construction'.

(41) tangkwuk-i [(epcatul-uy) panana-uy swuip]-ul
government-NOM offers-GEN banana-GEN import-ACC
[kumci]-lul <u>ha-ess-ta</u>.
prohibition-ACC do-PAST-DECL
'The government prohibited (the offers) from importing bananas.'‘

We have two verbal nouns in (41), *swui*p (import) and *kumci* (prohibition). While the subject argument *tangkwuk* (government) of *kumci* (prohibition) is realized at the sentence level, that of *swuip* (import) is optionally realized within the NP (cf. *epcatul* (the importers)). This is made possible in (40) by making the subject argument optional.

3.3 Functional Verbs and Functional Composition in HPSG

In this subsection, we examine how to describe functional verbs (FVs) in HPSG. As discussed in section 2, functional verbs have null or incomplete thematic information. In case the functional verb does not have any thematic information, VN determines the thematic relations between the arguments in the sentence containing the functional verb. An FV with no thematic information is the verb *hata* (to do). I will show how this FV should be represented in order to capture the idea alluded to above. Other FVs, which we turn to in the next section, can be represented in a similar manner.

Consider first the following sentence. It should be noted that the (bold-faced) VN is Case-marked although it determines the thematic relations in the sentence. Moreover, the Case-markers attached to the dependents of VN indicate that they are realized at the sentence level.

(42) Kim-i Bill-eykey chayk-ul cungceng-ul ha-ess-ta.
Kim-NOM Bill-to book-ACC present-ACC do-PAST-DECL
'Kim did present a book to Bill.' (lit.) = 'Kim presented a book to Bill.'

One of the questions raised in the foregoing discussion is how the dependents of the VN can be realized at the sentence level. I have assumed that the verb *hata* (to do) as an FV subcategorizes for VN and inherits argument structure from VN. This idea, however, would not be incorporated into the framework given above, if we merely specify FVs in the same way as other verbs. By the Valence Principle (see (36) above), the value of the feature VAL in the lexical entry of the head is cancelled when the head combines with an element that it subcategorizes for. As a result, no information would be inherited from its complements, i.e. from VNs in the complex predicates being discussed. This is not the result we want to get.

To incorporate the idea formulated above into the HPSG framework, we need a special lexical entry for FVs. For this purpose, I introduce a functional operation `append` (abbreviated as ⊕) which works on the VAL specification of the FV. Append combines two descriptions in the VAL feature as in (43a) to formulate a new description as in (43b).

(43) *append* (⊕) and its effect (b)

a. $\left[\begin{array}{ll}\text{SUBJ} & <\mathbf{A}> \\ \text{COMPS} & <\mathbf{B}> \oplus <\mathbf{C}>\end{array}\right]_{val}$ b. $\left[\begin{array}{ll}\text{SUBJ} & <\mathbf{A}> \\ \text{COMPS} & <\mathbf{B} \mid \mathbf{C}>\end{array}\right]_{val}$

With this operation we can model the lexical property of the FV *hata* (to do) as follows. Note that *hata* subcategorizes for a VN; the values of the SUBJ and COMPS are in turn structure-shared between that VN and the verb *hata* (to do). As a result, the arguments selected by VN turn into those of the complex predicate, i.e. the VN-*hata* string.

(44) *hata* (to do) as a functional verb (preliminary version)[19]

$$\left[\begin{array}{ll}
\text{PHON} & \text{/hata/} \\
\text{SYNSEM} & \left[\begin{array}{ll}
\text{LOC} & \left[\begin{array}{ll}
\text{CAT} & \left[\begin{array}{ll}
\text{HEAD} & {}_{verb}\left[\text{VFORM } \textit{base}\right] \\
\text{VAL} & \left[\begin{array}{ll}
\text{SUBJ} & \left\langle \boxed{5}\ \text{NP}_{\boxed{1}} \right\rangle \\
\text{COMPS} & \left\langle \left[\begin{array}{ll}
\text{CAT} & \left[\begin{array}{ll} \text{HEAD} & {}_{noun}\left[\text{PRED} \quad +\right] \\ \text{VAL} & \left[\begin{array}{ll}\text{SUBJ} & \langle \boxed{5}\ \text{NP}_{\boxed{1}}\rangle \\ \text{COMPS} & \boxed{2}\end{array}\right]_{val}\end{array}\right]_{cat} \\
\text{CONTENT} & \boxed{3}
\end{array}\right] \right\rangle \oplus \left\langle \boxed{2} \right\rangle
\end{array}\right]_{val}
\end{array}\right]_{cat} \\
\text{CONTENT} & \boxed{3} \\
\text{CONTEXT} & \boxed{4}
\end{array}\right]_{loc}
\end{array}\right]_{synsem}
\end{array}\right]_{word}$$

The "`append`" mechanism used in the specification of VAL in (44) was initially proposed by Hinrichs & Nakazawa (1993) and adopted meanwhile in various research within HPSG (Gerdemann (1994), Kiss (1993), among others).[20]

Those familiar with Categorial Grammar will observe a similarity to the rule of functional composition, shown in (45).

(45) functional composition in a directional version of Categorial Grammar
  a. X/Y Y/Z → X/Z
  b. X\Y Y\Z → X\Z

It should be noted that the append assumed here differs from functional composition in Categorial Grammar. First of all, it is not a rule. As is often pointed out, functional composition in itself is too powerful and might overgenerate ungrammatical strings. Being not a rule but an operation on argument structures for capturing epiphenomena of functional verbs and the complex predicates, the "`append`" adopted in this paper avoids this undesired property of functional composition. Thus, it does not entail full inheritance of all information; inheritance of adjuncts, Case, etc. is safely excluded (cf. the next subsection).

The proposal (44), together with the specification of VNs in (40), explains some linguistically interesting issues. The following three points, among others, are straightforwardly born out from the proposal made above. First, the subject argument of VNs subcategorized for by *hata* (to do) must always be realized at the sentence level. Regardless of the optionality of the subject argument of VN,

[19] In section 6, we further extend the lexical entry of *hata* (to do) in order to cover other variants of complex predicates. We ignore other variants at the moment.

[20] Pollard (in press) also suggests that functional composition be used for description of the verb cluster formation in German. An analysis adopting the notion is found in Kiss (1993). Cf. Gerdemann (1994) for a discussion on the mechanism in describing complement inheritance in morphology. We apply the mechanism only on the specification of VAL specification. Another difference is that Case-specifications are not transferred since we do not specify Case-information on the VAL of nominals.

the verb *hata* (to do) requires that the subject argument be transferred to the complex predicate. This is illustrated in the following examples where the subject argument of the VN *tayhwa* (talk) occurs once inside and outside of the NP.

(46) sentences with a NP-internal subject argument

a. *[$_{NP}$ Kim-uy Bill-kwa-uy tayhwa]-lul ha-ess-ta.
Kim-GEN Bill-with-GEN talk-ACC do-PAST-DECL
'*Kim's talk to Bill did.'

b. *Bill-kwa [$_{NP}$ Kim-uy tayhwa]-lul ha-ess-ta.
Bill-with Kim-GEN talk-ACC do-PAST-DECL
'*Kim's talk to Bill did.'

(47) sentences with a NP-external subject argument

a. Kim-i [$_{NP}$Bill-kwa-uy tayhwa]-lul ha-ess-ta.
Kim-NOM Bill-with-GEN talk-ACC do-PAST-DECL
'Kim did [talk to Bill].' (lit.)

b. Kim-i Bill-kwa tayhwa-lul ha-ess-ta.
Kim-NOM Bill-with talk-ACC do-PAST-DECL
'Kim did talk to Bill.' (lit.)

In all the examples above, *hata* subcategorizes for the VN *tayhwa* (talk). The difference in grammaticality between (46) and (47) shows that the subject argument of the VN can never be left inside of the NP.

Another essential consequence of the representation of the FV *hata* is that it transfers the argument structure of the VN to the head *hata* via structure sharing. I will call this effect argument transfer, since according to (44) the FV *hata* (to do) first combines with the VN and then takes over the argument structure of the VN, as a result of which the argument structure of the VN is transferred to the complex predicate.

The third point that is handled is the semantic contribution of the FV *hata* (to do). The CONTEXT value of the verb is also structure-shared with that of the VN. This means that the psoa of the VN is preserved in the complex predicate. The information originally accompanying the verb *hata* (to do) such as tense and aspect is represented in terms of the CONTEXT feature. This information is also preserved for the complex predicate.

3.4 Immediate Dominance Schemata and Case-Marking

The central idea we are advancing is that VNs combining with FVs form complex predicates such that the arguments which are not saturated within the maximal projection of the VN are transferred to the FV. To make the idea work we need to develop a mechanism which regulates the realization of arguments inside and outside of the NP. I introduce a Case-marking system in Korean to generate well-formed NPs and sentences. The purpose of this subsection is not to examine the whole Case-marking system in Korean, but to explain how arguments are realized within the maximal projection of VN, and how the transferred arguments are realized at the sentence level.

In Korean, all phrases inside of an NP must be realized with the genitive Case-marker -uy, whereas the subject and direct object of a sentence have nominative and accusative Case-markers respectively (see (46) and (47)). Given the difference of Case-marking within NP and S and our assumption that some or all arguments of VNs are transferred to FVs, argument transfer must be understood as transferring arguments without Case specification. Note that, unlike in English examples, I do not specify Case-information in the lexical entries in Korean. Instead, I assume that Case is specified on Immediate Dominance Schemata (ID-Schemata) which is relevant for the projection of heads in HPSG as X-bar theory is in PPT.

All Case-markers are introduced as MARKER-DTR which is again introduced by the Head-Marker Schema. (48) is a somewhat extended version of the Head-marker Schema of HPSG 2.

(48) Head-Marker Schema

$$_{synsem}\left[\ldots\ _{cat}\left[\begin{array}{ll} \text{HEAD} & \boxed{1} \\ \text{VAL} & \boxed{2} \\ \text{MARKING} & \boxed{3} \\ \text{LEX} & \textit{minus} \end{array} \right] \right] \rightarrow$$

$$\boxed{4}\ _{synsem}\left[\ldots\ _{cat}\left[\begin{array}{ll} \text{HEAD} & \boxed{1} \\ \text{VAL} & \boxed{2} \\ \text{LEX} & \textit{minus} \end{array} \right] \right],\quad _{synsem}\left[\ldots\ _{cat}\left[\begin{array}{l} \text{HEAD}\ _{functional}\left[\text{SPEC}\ \boxed{4} \right] \\ \text{MARKING}\ \boxed{3} \\ \text{LEX}\ \textit{plus} \end{array} \right] \right]$$

Although markers select the phrases they mark as heads, they do not have any semantic contribution. Accordingly, the semantic information of the mother remains unchanged. This relation is expressed in the SPEC Principle.

(49) The SPEC Principle (P&S in press: 492)
In a headed phrase whose non-head daughter MARKER-DTR has a SYNSEM|LOC|CAT|HEAD value of sort *functional*, the SPEC value of that value must be token identical to the phrase's DTRS|HEAD-DTR|SYNSEM value.

The SPEC Principle says that the SYNSEM value of the marked mother is identical to that of head daughter. As in P&S' (in press: 40) treatment of the English complementizers that and for as markers, the MARKER-DTR forms a constituent with the phrase which heads the constituent. Two technical details need to be explained with respect to the Head-Marker Schema (48). First, Case-markers cannot be attached to lexical categories ([LEX *plus*]), since marker always selects a phrasal node. Secondly, markers cannot occur repeatedly, since the marked phrase is always specified as marked.

Now, consider the Case-marking within the maximal projection of VNs. In Korean only one Case-marker, the genitive Case-marker *-uy*, is available for Case-marking of NP-internal arguments. I will specify the lexical entry of -uy as follows:

(50) the genitive Case-marker *-uy*

$$\begin{bmatrix} \text{PHON} & \text{/-uy/} \\ \text{SYNSEM} & \begin{bmatrix} \text{LOC} & \begin{bmatrix} \text{CAT} & \begin{bmatrix} \text{HEAD} & {}_{\textit{functional}}\begin{bmatrix}\text{SPEC NP}[\textit{unmarked}] \vee \text{PP}[\textit{unmarked}]\end{bmatrix} \\ \text{VAL} & \begin{bmatrix} \text{SUBJ} & \textit{elist} \\ \text{COMPS} & \textit{elist}\end{bmatrix} \\ \text{MARKING} & \textit{-uy} \end{bmatrix}\end{bmatrix}\end{bmatrix}\end{bmatrix}$$

The specification unmarked in (50) constrains the values of APEC, NP and PP. Because of this specification, MARKER-DTR can never be repeatedly attached within a phrase Now I introduce two schemata relevant for the realization of arguments within an NP.

(51) Schemata for the projection of the head noun[21]

a. The Subject-Head Schema
$\text{N}\begin{bmatrix}\text{SUBJ} < \ >, \text{COMPS } \textit{elist}\end{bmatrix} \rightarrow$
$\boxed{1} \sqcup \begin{bmatrix}\text{MARKING } \textit{-uy}\end{bmatrix}, \text{N}\begin{bmatrix}\text{SUBJ} < \boxed{1} >, \text{COMPS } \textit{elist}\end{bmatrix}$

b. The Complement-Head Schema (I)
$\text{N}\begin{bmatrix}\text{COMPS} < \boxed{2} >\end{bmatrix} \rightarrow$
$\boxed{1} \sqcup \begin{bmatrix}\text{MARKING } \textit{-uy}\end{bmatrix}, \text{N}\begin{bmatrix}\text{COMPS} < \boxed{1} \mid \boxed{2} >\end{bmatrix}$

c. The Complement-Head Schema (II)
$\text{N}\begin{bmatrix}\text{COMPS } \textit{elist}\end{bmatrix} \rightarrow$
$\boxed{1} \sqcup \begin{bmatrix}\text{MARKING } \textit{-uy}\end{bmatrix}, \text{N}\begin{bmatrix}\text{COMPS} < \boxed{1} >\end{bmatrix}$,
where $\boxed{1} \sqcup [\text{MARKING } \textit{-uy}]$ is the unification of $\boxed{1}$ and ${}_{cat}[\text{MARKING } \textit{-uy}]$.

All three schemata are relevant for the realization of the arguments of a VN within its maximal projection. The schemata require that each argument, be it subject, direct object or a more oblique argument, should be marked by a genitive Case-marker when it is realized within the maximal projection of the noun. (51a) is similar to the SPR-HEAD Schema in HPSG 3. The last two schemata are specific to Korean NP in that, if COMPS value contains more than two arguments, the least oblique argument among them should be realized first inside the NP.

There are some significant differences between NP and S in Korean. Word order, for instance, is free in S, but not in NP. While argument positions are fixed within an NP, they can be scrambled almost freely in S, as long as some constrain dictates otherwise. The subject should be followed by other complements within an NP as illustrated in (52). A less clear case is the constraint of the direct object position. The contrast between examples (a) and (b) in (53) and (54) seems to be subject to this constraint. Given the Schema (51b), the direct object should occur

[21] The Subject-Head Schema in (51a) will not be used in the verbal noun construc-tions, since the subject argument of a verbal noun should always be realized at the sentence level. It is given for a general Case-marking system within NP including the cases in (7) and (8).

in the position immediately preceding the noun. Besides the examples in (53) and (54), further possible evidence is found in ordering hierarchy: PP arguments, if there are any, are realized in the position between subject and direct object. In section 4, I present some more supporting data for this constraint.

(52) a. *ku chayk-uy Kim paksa-uy penyek
the book-GEN Dr. Kim-GEN translation
'Dr. Kim's translation of the book'

b. *Bill-kwa-uy Kim-uy hapsek
Bill-with-GEN Kim-GEN table sharing
'Kim's table sharing with Bill'

(53) a. Kim-uy Lee-eykey-uy kkoch-uy senmwul
Kim-GEN Lee-to-GEN flower-GEN gift
'Kim's gift of flowers to Lee' (lit.)

b. ?/*Kim-uy kkoch-uy Lee-eykey-uy senmwul
Kim-GEN flower-GEN Lee-to-GEN gift
'Kim's gift of flowers to Lee' (lit.)

(54) a. Kim-uy sacang-eykey-uy sanghwang-uy poko
Kim-GEN president-to-GEN the state of arts-GEN briefing
'Kim's briefing of the state of arts to the president' (lit.)

b. ?/*Kim-uy sanghwang-uy sacang-eykey-uy poko
Kim-GEN the state of arts-GEN president-to-GEN briefing
'Kim's briefing of the state of arts to the president' (lit.)

Let us consider now Case-marking at the sentence level. Here, we simply focus on the verbal category. Unlike the proposed three schemata (51) for the projection of head nouns, the schema (55) deals with the relative freedom of word order in Korean: it states that all members of the subsort head-subj-comp-structure should be concatenated simultaneously. There is no ordering constraint between the arguments. As a result, all selected complements become sisters of the lexical sign of the verb.

(55) Subject-Complement-Head Schema for the projection of head verbs

$$\mathrm{V}\Big[\mathrm{SUBJ}\ \textit{elist},\ \mathrm{COMPS}\ \textit{elist}\Big] \rightarrow$$
$$\boxed{1} \sqcup \Big[\mathrm{MARKING}\ \textit{-ka/-i}\Big],\ \boxed{2} \sqcup \Big[\mathrm{MARKING}\ \textit{-lul/-ul}\Big],\ \boxed{3},\ \mathrm{V}\Big[\mathrm{SUBJ} < \boxed{1} >,\ \mathrm{COMPS} < \boxed{2} \mid \boxed{3} >\Big],$$

where $\boxed{n} \sqcup [\mathrm{MARKING}\ \mathbf{x}]$ is the unification of $\boxed{n}$ and ${}_{cat}[\mathrm{MARKING}\ \mathbf{x}]$.

It is important to note that in (55) we have assumed only two kinds of Case, nominative and accusative. Under this assumption, all other phrases are postposition phrases (PPs) where the form of postposition must be selected by the head. This means that nominative and accusative Case-markers need not be specified on the lexical entry of the head because they are realized at surface structure as *ka/i*, *lul/ul*, depending on the VAL features SUBJ and COMPS, respectively.[22]

The choice of the first or the second option is triggered by the phonological environment. When nominative and accusative Case-markers follow a word that ends with a vowel, they are realized with the former form, otherwise, with the latter.

Both Case-markers are also introduced by the Head-Marker Schema given in (48). The accusative Case-marker in Korean, *-lul/-ul*, is specified as in (56). The nominative Case-marker can be specified in the same way.

(56) head-marker-structure and the accusative Case-marker *-ul*

$$ {}_{synsem}\left[\ \ldots\ {}_{cat}\left[\begin{array}{ll}\text{HEAD} & \boxed{1}\\ \text{VAL} & \boxed{2}\\ \text{MARKING} & \boxed{3}\\ \text{LEX} & \textit{minus}\end{array}\right]\right] $$

HEAD-DTR MARKER-DTR

$$ \boxed{4}\ {}_{synsem}\left[\ \ldots\ {}_{cat}\left[\begin{array}{ll}\text{HEAD} & \boxed{1}\ \text{NP}\\ \text{VAL} & \boxed{2}\\ \text{LEX} & \textit{minus}\end{array}\right]\right] \qquad {}_{synsem}\left[\ \ldots\ {}_{cat}\left[\begin{array}{l}\text{HEAD}\ {}_{functional}\left[\text{SPEC}\ \boxed{4}\right]\\ \text{VAL}\ {}_{val}\left[\begin{array}{ll}\text{SUBJ} & \textit{elist}\\ \text{COMPS} & \textit{elist}\end{array}\right]\\ \text{MARKING}\ \boxed{3}\ \textit{-uy}\\ \text{LEX}\ \textit{plus}\end{array}\right]\right] $$

Kim -ul

To sum up, I tried to incorporate the idea formulated in section 3 into the framework of HPSG in this section. Some proposals were made or adopted: in terms of the Boolean feature [PRED] and other features, the feature structure of a VN is modelled similar to that of a verb. For the representation of functional verbs I adopted the "`append`" operation which works on the VAL specification of FVs. Finally, I developed a Case-marking system for NPs and S in Korean. Some of the important features in this system are the feature [LEX], the Head-Marker-Schema and the Schemata for the projection of head nouns and head verbs. One of the consequences of this Case-marking system is that Case-markers or Case-specifications are not transferred in the process of the argument transfer.

[22] The dative Case may be examined more closely. In most cases, a dative Case-marker behaves like postposition. In some cases, however, it seems to be similar to nominative or accusative Case-markers. The fact seems to relate to the dative shift phenomena as observed in English. We leave aside the issue in this paper.

4 Aspects of Argument Transfer

In this section, it will be shown that structure-sharing between the VAL specifications of VNs and FVs makes it possible to transfer the arguments originally selected by the VN to the FV if they are not saturated within the NP. The locality condition is satisfied in our analysis. In HPSG terms this condition says that there is no language in which DAUGHTERS (DTRS) determine the VALENCE specification of lexical signs, i.e. of the element subcategorizing it. Likewise, the VALENCE feature of lexical signs specifies values for SYNSEM, but not the attribute DAUGHTERS. If an argument is realized inside the NP, it must be Case-marked as genitive and cancelled on the specification of the VAL feature at the same time. On the contrary, if an argument is not saturated within the maximal projection of a noun, then, the Valence Principle requires it to be passed on to the mother node. Since the argument structure of a VN is structure-shared with that of an FV, the FV inherits the arguments of the VN and Case-marks them. As a result, a verbal noun complex predicate is formed indirectly. In this section, I will focus mainly the complex predicates formed by VNs and the FV *hata* (to do). Those made by VNs and other FVs will be discussed in section 5.

4.1 The SUBJ argument

Under the proposal in section 3, in particular the specification of the functional verb *hata* (to do), the subject argument of the VN must be realized at the sentence level. This is because the subject argument is structure-shared with that of *hata* (to do) (cf. (44) above). As far as the realization of the subject argument is concerned, the analysis here is basically similar to the analysis of the Raising construction in HPSG, except that the subject position cannot be occupied by expletives.

4.2 COMPS with a List of Length One

When two arguments are selected by a VN, the other argument apart from the subject may remain within the maximal projection of the VN. Consider again the examples in (57) where, besides subject, a PP argument is selected by VN.

(57) a. Kim-i Bill-kwa hapsek-ul <u>ha-ess-ta</u>.
Kim-NOM Bill-with table sharing-ACC do-PAST-DECL
'Kim did table sharing with Bill.' (lit.) '
= 'Kim shared table with Bill.'

b. Kim-i Bill-kwa-uy hapsek-ul <u>ha-ess-ta</u>.
Kim-NOM Bill-with-GEN table sharing-ACC do-PAST-DECL
'Kim did table sharing with Bill.' (lit.)
= 'Kim shared able with Bill.'

As predicted, the PP argument can be realized inside the maximal projection of the verbal noun *hapsek* (table sharing) as in (57b). The explanation of both examples is straightforward in our framework. If no argument is realized within NP, all arguments must be transferred to the complex predicate *hapsek-ul hata* (to share table), a case exemplified in (57a).

Suppose the Complement-Head Schema II proposed in (51c) is applied. In this case, the PP argument is realized within NP, and the subject argument is transferred to the complex predicate. I illustrate the process of argument transfer for the sentence (57b) as follows.

(58) a simplified tree diagramm for the sentence (57b)

We have no difficulty either in dealing with cases where VN selects two NP arguments, as in (59). In our framework, the examples in (57) and (59) are treated basically in the same way since there is one SUBJ argument and one COMPS argument in both cases ((59) = (6)).

(59) a. Kim paksa-ka ku chayk-uy penyek-ul <u>ha-ess-ta</u>.
Dr. Kim-NOM the book-GEN translation-ACC do-PAST-DECL
'Dr. Kim did translation of the book.'

b. Kim paksa-ka ku chayk-ul penyek-ul <u>ha-ess-ta</u>.
Dr. Kim-NOM the book-ACC translation-ACC do-PAST-DECL
'Dr. Kim did translation of the book.'

4.3 COMPS with a List of Length Two

Let us now consider VNs which take three arguments. This case is somewhat complicated since two arguments are specified on the COMPS value of VNs. Depending on whether or not the Complement-Head Schemata I and II in (51) are applied within the maximal projection of the verbal noun, the distribution of arguments shows three variations as in (60).

(60) a. Kim-i ku chayk-ul Bill-eykey kicung-ul ha-ess-ta.
Kim-NOM the book-ACC Bill-to donation-ACC do-PAST-DECL
'Kim did donation of the book to Bill.'

b. Kim-i Bill-eykey [ku chayk-uy kicung]-ul ha-ess-ta.
Kim-NOM Bill-to the book-GEN donation-ACC do-PAST-DECL
'Kim did donation of the book to Bill.'

c. (?)Kim-i [Bill-eykey-uy ku chayk-uy kicung]-ul
Kim-NOM Bill-to-GEN the book-GEN donation-ACC
ha-ess-ta.
do-PAST-DECL
'Kim did donation of the book to Bill.'

In (60a) all arguments are transferred to the FV *hata* (to do), i.e., they are arguments of the complex predicate *kicung-ul hata* (donate). While only the Complement-Head Schema I is applied in (60b), the application of Complement-Head Schemata I and II results in the sentence in (60c). To clarify the process of the complex predicate formation, I will illustrate the structure underlying in (60a).

(61) a simplified tree diagramm for the sentence (60a)

A less clear point concerning the sentence in (60c) is that the realization of more than one argument within NP degrades the acceptability of the sentence. Some psychological process appears to be involved in this. When all arguments are transferred to *hata* (to do) as in (60a), the Subject-Complement-Head Schema for the projection of the head verb (cf. (55) above) makes it possible to scramble freely the arguments.[23]

Two of the possible sentences are illustrated in (62).

(62) a.

Kim-i	ku chayk-ul	Bill-eykey	kicung-ul	<u>ha-ess-ta</u>.
Kim-NOM	the book-ACC	Bill-to	donation-ACC	do-PAST-DECL

‘Kim did donation of the book to Bill.’ (NP[NOM]-NP[ACC]-PP)

b.

Bill-eykey	ku chayk-ul	Kim-i	kicung-ul	<u>ha-ess-ta</u>.
Bill-to	the book-ACC	Kim-NOM	donation-ACC	do-PAST-DECL

‘Kim did donation of the book to Bill.’ (PP-NP[ACC]-NP[NOM])

Now consider the following sentences in which the more oblique PP argument is preceded by the less oblique NP argument within the maximal projection of the verbal noun. These sentences are excluded; more precisely, they are not generated at all, since they violate the Complement-Head Schema I in (51).

[23] We need to specify [LEX *plus*] $<$ [LEX *minus*] for lexical signs that are not to be scrambled with its complements.

(63) a. *Kim-i ku chayk-ul [Bill-eykey-uy kicung]-ul
Kim-NOM the book-ACC Bill-to-GEN donation-ACC
ha-ess-ta.
do-PAST-DECL
'Kim did donation of the book to Bill.'

b. *Kim-i [ku chayk-uy Bill-eykey-uy kicung]-ul ha-ess-ta.
Kim-NOM the book-GEN Bill-to-GEN donation-ACC do-PAST-DECL
'Kim did donation of the book to Bill.'

The distribution of the arguments in complex predicates in which verbal nouns take more than three arguments is treated in the same way as in cases where verbal nouns take three arguments.

5 Grammatical Function Changing

In this section I will try to show how the proposal given in section 3 can also be used to describe the grammatical function phenomena found in VNCs. I will focus on how we should specify the causative and the passive functional verb.

5.1 Causative Verbal Noun Constructions

Given the analysis of the active VNCs with the FV *hata* (to do) presented in section 4, the analysis of causative VNCs is straightforward. As in active VNCs, the arguments of a VN are transferred to the FV if they are not saturated within NP. Consider the examples in (64).

(64) a. Kim-i thongsalon-ul yenkwu-lul ha-ess-ta.
Kim-NOM syntax-ACC research-ACC do-PAST-DECL
'Kim did research in syntax.' (lit.)

b. Lee-ka Kim-eykey thongsalon-ul yenkwu-lul sikhi-ess-ta.
Lee-NOM Kim-to syntax-ACC research-ACC cause-PAST-DECL
'Lee caused Kim to do research in syntax.' (lit.)

Unlike *hata* (to do), the functional verb *sikhita* (to cause) takes its own partial argument structure. It subcategorizes for a VN and a subject argument, the causer argument. In other words, a VN of valency `n` is related to the corresponding verbal noun causative of valency `n+1`. Note that unlike with the active VNCs, the grammatical function of the arguments of the VN is changed in the causative VNCs. I regard this grammatical function changing phenomenon as being triggered by the meaning of the functional verb *sikhita* (to cause). A sample lexical entry for the functional verb *sikhita* (to cause) is given in (65).

(65) the causative functional verb *sikhita* (to cause)

$$
{}_{word}\left[\begin{array}{l}
\text{PHON /sikhita/} \\
\ldots\ {}_{loc}\left[\begin{array}{ll}
\text{CAT} & {}_{cat}\left[\begin{array}{ll}
\text{HEAD} & {}_{verb}\left[\text{VFORM } bse\right] \\
\text{VAL} & {}_{val}\left[\begin{array}{ll}
\text{SUBJ} & \left\langle \text{NP}_{\boxed{1}} \right\rangle \\
\text{COMPS} & \left\langle \left[\begin{array}{ll}
\text{CAT} & {}_{cat}\left[\begin{array}{ll}
\text{HEAD} & {}_{noun}\left[\text{PRED } +\right] \\
\text{VAL} & {}_{val}\left[\begin{array}{ll}
\text{SUBJ} & \left\langle \boxed{2}\ \text{NP}_{\boxed{4}} \right\rangle \\
\text{COMPS} & \left\langle \boxed{3}\ \text{NP}_{\boxed{5}} \right\rangle
\end{array}\right]
\end{array}\right] \\
\text{CONTENT} & \boxed{6}
\end{array}\right] \right\rangle \oplus \left\langle \boxed{2} \mid \boxed{3} \right\rangle
\end{array}\right]
\end{array}\right] \\
\text{CONTENT} & {}_{cause}\left[\begin{array}{ll}
\text{RELATION} & \text{cause} \\
\text{CAUSER} & \boxed{1} \\
\text{CAUSEE} & \boxed{4} \\
\text{CAUSDED-PSOA} & \boxed{6}
\end{array}\right]
\end{array}\right]
\end{array}\right]
$$

The arguments of VNs in the causative VNCs are realized in the same way as in the active VNCs with the FV *hata*. All or some of the arguments of VNs can be realized at the sentence level.

(66) a. Lee-ka Kim-eykey thongsalon-ul yenkwu-lul <u>sikhi-ess-ta</u>.
Lee-NOM Kim-to syntax-ACC research-ACC cause-PAST-DECL
'Lee caused Kim to do research in syntax.' (lit.)

b. Lee-ka Kim-eykey [thongsalon-uy yenkwu]-lul <u>sikhi-ess-ta</u>.
Lee-NOM Kim-to syntax-GEN research-ACC cause-PAST-DECL
'Lee caused Kim to do research in syntax.' (lit.)

c. *Lee-ka Kim-eykey-uy thongsalon-ul [yenkwu]-lul <u>sikhi-ess-ta</u>.
Lee-NOM Kim-to-GEN syntax-ACC research-ACC cause-PAST-DECL
'Lee caused Kim to do research in syntax.' (lit.)

d. *Lee-ka [Kim-eykey-uy thongsalon-uy yenkwu]-lul <u>sikhi-ess-ta</u>.
Lee-NOM Kim-to-GEN syntax-GEN research-ACC cause-PAST-DECL
'Lee caused Kim to do research in syntax.' (lit.)

The ungrammatical sentences in (66c) and (66d) suggest that the subject argument of VNs may not be realized within the maximal projection of the VNs. Note that the Case-marking of the subject argument of verbal nouns needs an additional specification. Since it can be either marked with an accusative Case or attached to the postposition *-eykey*, the Case-marking mechanism in its given form in section 3.4 may not predict this irregularity. Compare the sentences in (67) with those in (66).

(67) a. Lee-ka Kim-ul thongsalon-ul yenkwu-lul <u>sikhi-ess-ta</u>.
Lee-NOM Kim-ACC syntax-ACC research-ACC cause-PAST-DECL
'Lee caused Kim to do research in syntax.' (lit.)

b. Lee-ka Kim-ul [thongsalon-uy yenkwu]-lul <u>sikhi-ess-ta</u>.
Lee-NOM Kim-ACC syntax-GEN research-ACC cause-PAST-DECL
'Lee caused Kim to do research in syntax.' (lit.)

The problem can be solved by specifying the Case of the transferred SUBJ argument of the VN (cf. the boxed integer $\boxed{2}$ of $< \boxed{2} \mid \boxed{3} >$ in the VAL specification of *sikhita*) as MARKED [*-lul*/*-eykey*] on the COMPS value of the FV *sikhita* (to cause). As a consequence, the transferred SUBJ argument of the VN can be marked by either *-lul* or *-eykey*. I illustrate the whole structure for the example (67b) in order to clarify the argument transfer and the Case-marking of VNs in causative VNCs.

(68) a simplified sample structure for the causative VNCs

Before discussing passive VNCs, I will look at the relation of the causative VNCs to other types of causatives in Korean. According to Choi (1929), there are basically two other ways of forming causative constructions in Korean: periphrastic causatives and morphological causatives. The two types of causatives are schematized as follows:

(69) periphrastic and morphological causatives in Korean: Choi (1929)
  a. periphrastic causatives:
     verbal or adjectival stem#key hata
  b. morphological causatives:
     verbal or adjectival stem#causative morpheme

The most productive way between them of forming causative constructions is periphrastic causative formation, where verbs or (predicative) adjectives suffixed by -*key* are followed by the causative verb *hata* (to cause).[24]

Morphological causatives are formed by attaching a causative morpheme to a verb and/or a (predicative) adjective. Seven causative morphemes are available in Korean: *i, hi, li, ki, wu, kwu, chwu.*[25] It is not surprising that causative VNCs

[24] It should not be confused with two typographically identical verbs *hata*. To avoid possible confusion, I will gloss differently such that the functional verb *hata* is glossed as "to do" and causative verb *hata* as "to cause".

[25] The question of which morpheme has to be attached to which predicate has not been fully investigated. S. Lee (1986: 214) suggests that, like passive allomorphs, the attachment of causative morphemes is subject to some phonological rules. Causative predicates are derived by attaching one of the seven allomorphs to the stem of a predicate, as illustrated below.

(i) morphological causative formation from transitive verbs
  a. mek-**i**-ta 'to cause eat' mek-ta 'to eat'
  b. ip-**hi**-ta 'to cause wear' ip-ta 'to wear'
  c. tul-**li**-ta 'to cause carry' tul-ta 'to carry'
  d. an-**ki**-ta 'to cause undertake' an-ta 'to undertake'
  e. ci-**wu**-ta 'to cause hold' ci-ta 'to hold'

(ii) morphological causative formation from intransitive verbs
  a. ca-wu-ta'to cause to sleep'ca-ta'to sleep'
  b. nok-**i**-ta 'to cause to melt' nok-ta 'to melt'
  c. anh-**hi**-ta 'to cause to sit' anh-ta 'to sit'
  d. nal-**li**-ta 'to cause to fly' nal-ta 'to fly'
  e. nam-**ki**-ta 'to cause to remain' nam-ta 'to remain'
  f. pi-**wu**-ta 'to cause to vacate' pi-ta 'to vacate'
  g. mac-**chwu**-ta 'to cause to match' mac-ta 'to match'

(iii) morphological causative formation from adjectives or stative verbs
  a. nop-hi-ta'to cause to be high'nop-ta'to be high'
  b. palk-**hi**-ta 'to cause to be bright' palk-ta 'to be bright'
  c. pwul-**li**-ta 'to cause to soak' pwul-ta 'to soak'
  d. nuc-**chwu**-ta 'to cause to be late' nuc-ta 'to be late'

It is generally assumed that the periphrastic and morphological causatives are largely synonymous with each other, except for two aspects: (i) the former is bi-clausal and allows additional permissive interpretation and (ii) the latter is mono-clausal (see K. Park (1986, 6f.) for the discussion of this issue).

are not formed by the ways given in (69). This follows directly from the fact that VNs are neither verbal nor adjectival stems. However, once causative VNCs are formed by the FV *sikhita* (to cause), one can form further multiple causatives from a causative VNC.

(70) multiple causatives derived from a causative VNC

a. yenkwu-lul sikhi-key hata
research-ACC cause-SF cause
'to cause (someone) to cause (someone) to research'

b. kwulpok-ul sikhi-key hata
surrender-ACC cause-SF cause
'to cause (someone) to cause (someone) to surrender'

So far, we have discussed the causative formation from verbal nouns. In the next section we examine the passive formation from verbal nouns, in which the grammatical function of the arguments of verbal nouns are changed.

5.2 Passive Verbal Noun Constructions

For the formation of verbal noun passives, at least three FVs are available; *toyta* (to be), *patta* (to get), *tanghata* (to suffer negatively). Since from an argument structure theoretical point of view the latter two FVs function similarly, we mainly examine *toyta* (to be) and *patta* (to get) in this section.

5.2.1 THEME Passives

It is generally acknowledged that passivization changes a transitive lexical sign whose subject is AGENT and whose object is THEME to a grammatically intransitive lexical sign. The intransitive lexical sign typically lacks an object argument (see also the discussion of ergative verbal nouns in section 6.4). The change of the grammatical functions which is sometimes called argument reduction, is observed in the passive formation from verbal nouns. Let's take an example in which the FV *toyta* (to be) combines with the VN *cungceng* (dedication).

(71) a. Lee-ka Kim-eykey nonmwun-ul cungceng-ul ha-ess-ta.
Lee-NOM Kim-to paper-ACC dedication-ACC be-PAST-DECL
'Lee dedicated the paper to Kim.'

b. nonmwun-i Kim-eykey cungceng-i toy-ess-ta.
paper-NOM Kim-to dedication-NOM be-PAST-DECL
'The paper was dedicated to Kim.'

c. *Kim-i nonmwun-ul cungceng-i toy-ess-ta.
Kim-NOM paper-ACC dedication-NOM be-PAST-DECL
'Kim was dedicated the paper.'

d. *Kim-i nonmwun-i cungceng-i toy-ess-ta.
Kim-NOM paper-NOM dedication-NOM be-PAST-DECL
'Kim was dedicated the paper.'

The FV *toyta* (to be) requires that the object argument ('the paper') of the VN be the subject of the corresponding passive sentences. At the same time the accusative Case assigned to the verbal noun in (71a) is changed to the nominative Case in the passive sentence (cf. (71c) and (71d)). The contrast between (71b) and (71c) shows that only one object argument can be the subject of the passive sentence. An immediate question is which argument can be the subject of the passive VNCs with the FV *toyta* (to be). Concerning this question, I will assume that only a THEME argument can be the subject of the passive VNCs with the FV *toyta*, and the FV *toyta* (to be) only subcategorizes for VNs which contain a THEME argument in their argument structure. As evidence for this assumption I will show the following examples in (72). Note that the VN *cungpal* (evaporation) is intransitive as shown in (72a), nevertheless it combine with the FV *toyta* to form a passive VNC as in (72c).

(72) a. *Lee-ka mwul-ul cungpal-ha-ess-ta.
Lee-NOM water-ACC evaporation-do-PAST-DECL
'*Lee evaporated water.'

b. mwul-i cungpal-ha-ess-ta.
water-NOM evaporation-do-PAST-DECL
'Water evaporated.'

c. Lee-ka mwul-ul cungpal-sikhi-ess-ta.
Lee-NOM water-ACC evaporation-cause-PAST-DECL
'Lee caused water to evaporate.'

This implies that if a VN contains a THEME argument, then independently of its transitivity it can form a passive VNC with the FV *toyta* (to be).[26]

Thus, it would not be surprising to note that not all VNs form passive VNCs with *toyta*. The following examples make this point clear. The contrast can be easily explained if we assume that only the VN *kecel* (refusal) in (73a) takes a THEME argument.

(73) a. ku ceyan-i (kyengchal-eyuyhay) kecel-i toy-ess-ta.
that proposal-NOM (police-by) refusal-NOM be-PAST-DECL
'The proposal was refused (by police).'

b. *Mary-ka (Kim-eyuyhay) salang-i toy-ess-ta.
Mary-NOM Kim-by love-NOM be-PAST-DECL
'*Mary is loved by Kim.'

[26] Nominals like cungpal (evaporation) in (72) are in fact Ergative nominals. VNCs with Ergative VNs reveal other peculiarities that I will discuss in detail in a separate section, in 6.4 below.

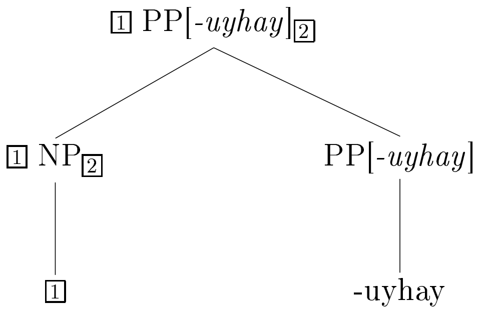
Based on the observation above I will propose to specify the lexical entry for the functional verb *toyta* (to be) in (74). Note that, unlike for the active and causative functional verbs, the `'append'` operation works on the SUBJ value instead of COMPS value of the functional verb *toyta* (to be). This is because the verb *toyta* (to be) selects only a subject and does not take any inherent object.

(74) a sample lexical entry for the functional verb *toyta* (to be) as used in (73a)

$$\left[\begin{array}{l} \text{PHON /toyta/} \\ \ldots \left[\begin{array}{ll} \text{CAT} & \left[\begin{array}{ll} \text{HEAD}_{verb} & [\text{VFORM } bse] \\ \text{VAL} & \left[\begin{array}{l} \text{SUBJ} \left\langle \left[\begin{array}{l} \text{CAT} \left[\begin{array}{ll} \text{HEAD}_{noun} & [\text{PRED } +] \\ \text{VAL} & \left[\begin{array}{l} \text{SUBJ}\langle \boxed{1}\ \text{NP}_{\boxed{2}}\rangle \\ \text{COMPS}\langle \boxed{3}\ \text{NP}_{\boxed{4}}\rangle \end{array}\right]_{val} \end{array}\right]_{cat} \\ \text{CONTENT } \boxed{5}\ [\text{THEME } \boxed{4}] \end{array}\right] \right\rangle \oplus \langle \boxed{3} \rangle \\ \text{COMPS} \left\langle \left(\boxed{1}\ \text{PP}[uyhay]_{\boxed{2}}\right) \right\rangle \end{array}\right]_{val} \end{array}\right]_{cat} \\ \text{CONTENT} & \boxed{5} \end{array}\right]_{loc} \end{array}\right]_{word}$$

The representation in (74) is intended to capture the facts that the FV *toyta* subcategorizes for a VN which takes at least a THEME argument, and that the THEME argument of the VN should be again specified on the SUBJ specification of the FV. As a result, the FV *toyta* takes as its subject argument the VN first and then the THEME argument of the VN. In the process of passive formation the CONTENT value of the VN remains unchanged by the structure sharing between the CONTENT of the *toyta* and of the VN. In (74) the COMPS value of the FV needs to be more precisely specified. Since the treatment of the optional PP which corresponds to the NP in the active sentence is certainly related to the passive formation in general, I leave it open here. Instead I tentatively abbreviate "$\boxed{1}$ PP[*uyhay*]$_{\boxed{2}}$" for the structure in (75).

(75)



Given the representation of the functional verb *toyta* (to be) as in (74), we can explain the ungrammaticality of (76b). The sentence is ungrammatical since the direct object of the VN is not transferred to the FV *toyta* (to be). In other words, the lexical requirement of the FV *toyta* (to be) is not satisfied, which results in ungrammaticality.

(76) a. [tosi-uy phakoy]
cityGEN destruction
'the destruction of the city'

b. *[tosi-uy phakoy]-ka toy-ess-ta.
city-GEN destruction-NOM be-PAST-DECL
'The city was destroyed.'

c. tosi-ka phakoy-ka toy-ess-ta.
city-NOM destruction-NOM be-PAST-DECL
'The city was destroyed.'

In the next section we discuss another type of verbal noun passives which are also highly sensitive to the argument structure of the VN.

5.2.2 Pseudo-Passives

The following examples with the VN *cungceng* (dedication) suggest that besides *toyta* (to be), another passive functional verb is available, i.e. *patta* (to get). Interestingly enough, the two passive FVs differ in the selection of their subject argument as shown in (77a) and (77b) and in the Case-marking of the VNs as shown in (77b) and (77c).

(77) a. nonmwun-i Kim-eykey cungceng-i toy-ess-ta.
paper-NOM Kim-to dedication-NOM be-PAST-DECL
'The paper was dedicated to Kim.'

b. Kim-i nonmwun-ul cungceng-ul pat-ass-ta.
Kim-NOM paper-ACC dedication-ACC get-PAST-DECL
'Kim was dedicated the paper.' (lit.)

c. *Kim-i nonmwun-ul cungceng-i pat-ass-ta.
Kim-NOM paper-ACC dedication-ACC get-PAST-DECL
'*Kim was dedicated the paper.'

Compared with the FV *toyta* (to be), the FV *patta* (to get) takes as its subject a RECIPIENT argument. The FV *patta* can not be used with VNs which do not take a RECIPIENT argument in their argument structures. Furthermore, the VN is assigned the accusative Case instead of nominative Case in the passive VNCs with *toyta*. Since the Case-marking in these passive VNCs is similar to those of active VNCs, it might be better to distinguish them from VNCs with other FVs. For this purpose I will call them "pseudo passive VNCs". These VNCs are passive because the FV *patta* changes the grammatical function of a THEME argument of a VN to the subject of the VNC. They shall be called pseudo because, unlike the general observation of passivization, the RECIPIENT argument instead of THEME argument is promoted to the subject in these VNCs, and because the Case-marking of the VN is different from those of the passive VNCs with the FV *toyta* (to be). I will specify the lexical representation of the FV *patta* (to get) as follows:

(78) a lexical entry for the functional verb *patta* (to get)

$$\left[\begin{array}{l} \text{PHON /patta/} \\ \ldots \left[\begin{array}{l} \text{CAT} \left[\begin{array}{l} \text{HEAD}_{\textit{verb}} \left[\text{VFORM bse}\right] \\ \text{VAL} \left[\begin{array}{l} \text{SUBJ} \left\langle \boxed{3} \right\rangle \\ \text{COMPS} \left\langle \left[\begin{array}{l} \text{CAT} \left[\begin{array}{l} \text{HEAD}_{\textit{noun}} \left[\text{PRED} +\right] \\ \text{VAL} \left[\begin{array}{l} \text{SUBJ} \left\langle \boxed{1}\ \text{NP}_{\boxed{2}} \right\rangle \\ \text{COMPS} \left\langle \ldots, \boxed{3}\ \text{NP}_{\boxed{4}} \right\rangle \end{array}\right]_{\textit{val}} \end{array}\right]_{\textit{cat}} \\ \text{CONTENT } \boxed{5} \left[\text{RECIPIENT } \boxed{4}\right] \end{array}\right] \right\rangle \oplus \left\langle \boxed{1}\ \text{PP}_{\boxed{2}} \right\rangle \end{array}\right]_{\textit{val}} \end{array}\right]_{\textit{cat}} \\ \text{CONTENT } \boxed{5} \end{array}\right]_{\textit{loc}} \end{array}\right]_{\textit{word}}$$

The representation in (78) shows that the FV *patta* subcategorizes for a VN, one of whose arguments should be specified as a RECIPIENT. This argument in turn will be realized as the subject of the FV because of structure sharing. Note further that, since the VN and the appended argument are specified on the COMPS value of the FV *patta*, they are marked with accusative instead of nominative. To make the passive formation with the FV *patta* I will illustrate the whole structure for the sentence (77b).

(79) a simplified structure for (77b)

In sum, the discussion in this section clearly shows that the passive formation from VNs is highly sensitive to the argument structure of the VNs. The proposal made above can explain the (un)grammaticality of the examples.

(80) verbal nouns which are passivized only by the FV *patta* (to get)
  a. salang 'love' *salang-i toyta ↔ salang-ul patta
  b. cwumok 'attention' *cwumok-i toyta ↔ cwumok-ul patta
  c. conkyeng 'respect' *conkyeng-i toyta ↔ conkyeng-ul patta
  d. hyeppak 'threat' *hyeppak-i toyta ↔ hyeppak-ul patta

(81) verbal nouns which are passivized only by the FV *toyta* (to be)
  a. tochak 'arrival' tochak-i toyta ↔ *tochak-ul patta
  b. yenkwu 'research' yenkwu-ka toyta ↔ *yenkwu-lul patta
  c. hoypok 'recovery' hoypok-i toyta ↔ *hoypok-ul patta
  d. insik 'recognition' insik-i toyta ↔ *insik-ul patta

(82) verbal nouns which are passivized by the FVs *toyta* and *patta*

a. kyengko 'warning' kyengko-ka toyta ↔ kyengko-ul patta
b. poko 'report' poko-ka toyta ↔ poko-lul patta
c. senmwul 'gift' senmwul-i toyta ↔ senmwul-ul patta
d. swuye 'awarding' swuye-ka toyta ↔ swuye-lul patta

So far we have focussed on only one variant of verbal noun construction, i.e., a VNC in which VNs are subcategorized for and Case-marked by functional verbs. In the next section we examine three variants of VNCs, namely Noun Incorporation in the VNCs, lexicalized LVCs and VNCs formed by ergative verbal nouns.

6 Variations of the Verbal Noun Constructions

6.1 Incorporation and the role of the feature LEX

It has been observed that in Korean Case-markers can be dropped – especially in colloquial speech – with the proviso that they are predictable from other components of the grammar. As discussed in section 2, verbal nouns are optionally Case-marked in the VNCs. It seems reasonable to assume that the Case-dropped VNCs are in fact Case-marked once and then dropped for some reasons which I cannot examine in this paper. They do not show any peculiarity with respect to modification by adjectives and argument transfer. On the contrary, the complex predicates with non-Case-marked VNs show some remarkable peculiarities with respect to modification by other categories as well as argument transfer. The complex predicates with non-Case-marked VNs which I will discuss below should not be confused with the Case-dropped complex predicates. I will call this variant of VNCs incorporated VNCs to distinguish them from other kinds of VNCs. The three variants with respect to the Case-marking of VNs are shown in (83).

(83) a. tolon-ul hata (Case-marked VNC)
discussion-ACC do
'to do discussion'

b. tolon-ø hata (Case-dropped VNC)
discussion-(ACC) do
'to do discussion'

c. tolon-hata (incorporated VNC)
discussion-do
'to discuss'

The Case-marked variant of VNCs is described in terms of the interaction of Universal Principles like the Head Feature Principle (HFP) and the Valence Feature Principle (VLP) and the Schemata proposed in section 3.4 (see the Head-Marker Schema in (48), the Schemata for the projection of head nouns in (51) and the Subject-Complement-Head Schema for the projection of head verbs in (55)). As for incorporated VNCs, I will show that they can be explained without any further assumption. I will try to argue that in the incorporated VNCs no Case is assigned at all, and that adjectives cannot modify the VNs which occur in the incorporated VNCs. I will assume that these VNs are lexical signs and assign the feature [LEX plus] (henceforth [+LEX]). As a consequence, the Case-marking system in section 3.4 cannot be applied.

Let us look at the modifier mismatching problem in VNCs more closely and see how we can explain it within the framework developed in section 3. The modifier mismatching problem occurs, among other instances, when an adjective modifies a verbal category. Consider first the following sentences in which the adjective *yukoyhan* (pleasant) and the adverb *yukoyhakey* (pleasantly) are followed by the VN *tayhwa* (talk).

(84) a. Seoul sicang-i simin-kwa yukhoyhan tayhwa-lul <u>ha-ess-ta</u>.
Seoul mayor-NOM citizen-with pleasant talk-ACC do-PAST-DECL
'The mayor of Seoul did pleasant talk with citizens.'

b. Seoul sicang-i simin-kwa yukhoyhakey tayhwa-lul
Seoul mayor-NOM citizen-with pleasantly talk-ACC
<u>ha-ess-ta</u>.
do-PAST-DECL
'The mayor of Seoul pleasantly talked with citizens.'

The sentences in (84) are grammatical, since no modifier mismatching is observed. The adjective yukhoyhan in (84a) modifies the verbal noun and the adverb yukhoyhakey in (84b) the functional verb. If the adverb intervenes between the NP-internal PP complement and the VN as in (85b), the sentence turns out to be ungrammatical.

(85) a. Seoul sicang-i [simin-kwa-uy yukhoyhan tayhwa]-lul
Seoul mayor-NOM citizen-with-GEN pleasant talk-ACC
ha-ess-ta.
do-PAST-DECL
'The mayor of Seoul pleasantly talked with citizens.'

b. *Seoul sicang-i [simin-kwa-uy yukhoyhakey tayhwa]-lul
Seoul mayor-NOM citizen-with-GEN pleasantly talk-ACC
ha-ess-ta.
do-PAST-DECL
'The mayor of Seoul pleasantly talked with citizens.'

Note, however, that, if the verbal noun *tayhwa* (talk) is incorporated into the functional verb *hata* (to do), the modification of the noun by adjectives is impossible as shown in (86).[27]

Compare (86) with (84).

[27] As for adjectival modification, Japanese contrasts with Korean. According to Sells (1989), the sentence in (ib) is ungrammatical, since in Japanese modification of verbal nouns by adjectives is not allowed. (examples from Ahn (1990: 227)).

(86) a. *Seoul sicang-i simin-kwa [yukhoyhan tayhwa]-ha-ess-ta.
Seoul mayor-NOM citizen-with pleasant talk-do-PAST-DECL
'The mayor of Seoul pleasantly talked with citizens.'

b. Seoul sicang-i simin-kwa yukhoyhakey tayhwa-ha-ess-ta.
Seoul mayor-NOM citizen-with pleasantly talk-do-PAST-DECL
'The mayor of Seoul pleasantly talked with citizens.'

Under the Case-marking and the argument transfer mechanism proposed in section 3, the functional verb *hata* (to do) selects a maximal projection of the VN. In this case the Case-marked VNCs are generated as in (85a). The data discussed above suggest that incorporated VNCs should be treated in some different way. For incorporated VNCs I will assume that the FV *hata* (to do) selects lexical verbal nouns, i.e. verbal nouns that are marked with [+LEX]. Since lexical categories cannot be Case-marked, a VN in incorporated VNCs cannot be Case-marked. Following P&S (in press), we assume that adjectives combine only with nouns of bar level one. As a consequence, an adjective cannot modify an incorporated VN and the modifier mismatching problem does not occur in our framework. I illustrate a partial structure for incorporated VNCs like in (86) as follows.

(87) a partial structure for incorporated VNCs

An advantage to this approach is that other elements such as Negation adverbials and delimiters are allowed to occur between the VN and the FV (see section 6.2 for variants in which no such elements are allowed to intervene).

One of the immediate consequences of the incorporation of VNs is that 'all' arguments of the incorporated verbal noun must be realized at the sentence level. This aspect of argument realization in the incorporated VNCs contrasts to that

(i) a. Taroo-ga Hanako-no ronbun-o **kibisiku** hihan-o simasita.
Taroo-NOM Hanako-GEN paper-ACC severely criticism-ACC do-PAST-DECL
'Taroo severely criticized Hanako's paper.'

b. *Taroo-ga Hanako-no ronbun-o **kibisii** hihan-o simasita.
Taroo-NOM Hanako-GEN paper-ACC severe criticism-ACC do-PAST-DECL
'Taroo did severe critic to Hanako's paper.' (lit.)

in the Case-marked or Case-dropped VNCs in which only a part of the arguments may be transferred to FVs.

(88) incorporated VNCs and the argument realization

a. *Kim-i Bill-eykey [ku chayk-uy kicung]-<u>ha-ess-ta</u>.
Kim-NOM Bill-to the book-GEN donation-do-PAST-DECL
'Kim did donation of the book to Bill.' (lit.)

b. Kim-i Bill-eykey ku chayk-ul [kicung]-<u>ha-ess-ta</u>.
Kim-NOM Bill-to the book-ACC donation-do-PAST-DECL
'Kim did donation of the book to Bill.' (lit.)

(89) Case-marked or Case-dropped VNCs and the argument realization

a. Kim-i Bill-eykey [ku chayk-uy kicung]-ul/ø <u>ha-ess-ta</u>.
Kim-NOM Bill-to the book-GEN donation-ACC do-PAST-DECL
'Kim did donation of the book to Bill.' (lit.)

b. Kim-i Bill-eykey ku chayk-ul [kicung]-ul/ø <u>ha-ess-ta</u>.
Kim-NOM Bill-to the book-ACC donation-ACC do-PAST-DECL
'Kim did donation of the book to Bill.' (lit.)

This contrast can be easily explained within our framework. Since the FVs subcategorize for VNs marked with [+LEX], none of the Schemata in (48) and (51), which are responsible for Case-marking of VNs and projection of the arguments within NP, can be applied. As a result, none of the arguments selected by VNs can be realized within NP. I illustrate the process of argument transfer in incorporated VNCs as follows:

(90) the argument transfer in incorporated VNCs

Note that the structure in (90) is similar to that in (61). Concerning the realization of arguments of VNs, both structures illustrate that all the arguments of the VN *kicung* (donation) are realized at the sentence level. Due to lack of space we do not discuss the grammatical function changing in incorporated VNCs. Note that the incorporation of VNs are also observed in causative and passive VNCs as well as in active VNCs like (90) (see section 5 for a detailed discussion of grammatical function changing in VNCs). In the next section I will discuss another variant of VNCs in which VNs and FVs are combined with each other in the lexicon so that they can never be separated from each other.

6.2 Lexicalized Verbs Containing *hata* (to do)

We have examined so far two variants of VNCs with respect to Case-marking of VNs. Questions concerning Case-marking of VNs have long been some of the most tricky questions in Korean and Japanese linguistics (for this issue see Miyagawa (1989) and Ahn (1990) among others). This is partly because the VNCs show very wide variations with respect to the Case-marking of VNs. The following examples clearly contrast with the two main variations discussed above with respect to the Case-marking of VNs and grammatical function changing. Nevertheless, they seem to share an important property with the VNCs derived by the FV *hata* (to do) in that the nominal parts obviously take their own argument structure, just as VNs do. I will call them "lexicalized verbs" with the verb *hata* (to do) and treat them as single lexical items.

(91) a. *ceng-i/ul hata ceng-hata
determination-NOM/ACC do determination-do
'to determine'
b. *phi-ka/lul hata phi-hata
avoid-NOM/ACC do avoid-do
'to avoid'
c. *kwu-ka/lul hata kwu-hata
seeking-NOM/ACC do seeking-do
'to seek'
d. *phay-ka/lul hata phay-hata
defeat-NOM/ACC do defeat-do
'to be defeated'

The examples show that the nominal parts cannot be Case-marked by the verbal parts. In fact, no elements can intervene between the nominal part and the verbal part *hata* (to do).[28]

Neither the Negation adverbials *an* (not), *ani* (not) and *mos* (cannot) nor delimiters *-man* (only), *-to* (also) may occur between the nominal and the verbal part.[29]

These elements, however, can intervene between the two parts in the VNCs as each (c)-example of (92) and (93) shows.

(92) delimiter *man* (only)
a. *ceng-man hata
determination-DEL do
'only to determine'
b. *phi-man-hata
avoid-DEL-do
'only to avoid'

[28] It has recently been brought to my attention that C. Lee (1973) has made a similar observation (in a personal communication with Prof. C. Lee). C. Lee (1973) observed in his dissertation that examples like *ceng-hata* (to determine) and *tho-hata* (to vomit), etc. do not allow causative formation with *sikhita* (to cause) as shown in **ceng-sikhita*, **tho-sikhita*. He also observed that no Case-marker may be inserted between the nominal part and the verbal part of these examples. I am grateful to him for pointing these facts out to me.

[29] In Ryu (1992), I have argued that the categorial status of the three Negation markers is adverbial. ≫Delimiters≪ refer to language-specific quantifier-like particles which are only observed in the highly restricted domain of languages. To my knowledge, Japanese and Ulithian (a Micronesian language) have delimiters as well. See Ryu (1993) for detailed discussion on delimiters.

c. yenkwu-man hata
research-DEL do
'only to research'

(93) Negation adverbial *an* (not)

a. *kwu an hata
seeking NEG do
'not to seek'

b. *phay an hata
defeat NEG do
'not to be defeated'

c. yenkwu an hata
research NEG do
'not to research'

The examples in (91) sometimes lead to assumptions that the "noun-verb" complex predicates in general, namely the VNCs in our term, are single words (for instance as in H.-S. Han (1988)).[30]

The analysis presented so far strongly contrasts with these claims, since we try to show that these complex predicates are not single words but are derived from verbal nouns. In this paper I argue that examples like (91) belong to a special class of complex predicates which have undergone the lexicalization process for some reason which cannot be clarified here.

Strictly speaking, they may not be VNCs in the context of this paper since they deviate from the VNCs in various respects. First of all, the nominal parts (91) never occur as independent words: **ceng*, **phi*, **kwu*, **phay*. Even though it is intuitively clear that examples like in (91) may be divided into a nominal and a verbal part, the two parts cannot occur separately. Thus, the nominals parts are neither words nor verbal nouns. Secondly, they are not passivized and causativized in the same way as VNs are. The nominal parts of the examples in (91) do not allow verbs other than *hata* (to do).

(94) a. yenkwu hata vs. ceng-hata
research do vs. determination-do

b. yenkwu sikhita vs. *ceng-sikhita
research cause vs. determination-cause

c. yenkwu toyta vs. *ceng-toyta
research be vs. determination-be

[30] H.-S. Han (1988, 572) claims that 'the morphological boundary of the complex N+*suru* is not so strong, as a consequence of which *suru* alone can undergo Verb Raising, leaving the noun part behind'. He does not make clear, however, whether these complex predicates are single words. The citation above clearly shows that he assumes that they are single words whose 'morphological boundary' is between the nominal and the verbal parts. Note that 'morphological boundary' can only refer to the internal structure of a word, not to separate words. (See section 7.1.2 for further arguments against his claims.)

Most lexicalized verbs are formed accidentally with monosyllabic nominal parts and the verbal part *hata* (to do). Thus one might claim that all monosyllabic VNs form lexicalized verbs. However, it is not the case. The verb *mal-hata* (to speak), for instance, has its causative counterpart *mal-sikhita* (to cause to speak). but **mal-toyta* (to be spoken).

In the framework given in this paper they are treated in the same way as verbs in general are (cf. (37) for the representation of the verb `hit` in English). A sample lexical entry for the lexicalized verbs is given below.

(95) a sample lexical entry for the lexicalized verb *cenghata* (to decide)

$$
{}_{word}\left[\begin{array}{l} \text{PHON /cenghata/} \\ \text{SYNSEM}\ {}_{synsem}\left[\begin{array}{l} \text{LOC}\ {}_{loc}\left[\begin{array}{l} \text{CAT}\ {}_{cat}\left[\begin{array}{l} \text{HEAD}\ {}_{verb}\left[\text{VFORM } \textit{bse}\right] \\ \text{VAL}\ {}_{val}\left[\begin{array}{l} \text{SUBJ } \left\langle \text{NP}_{\boxed{1}} \right\rangle \\ \text{COMPS } \left\langle \text{NP}_{\boxed{2}} \right\rangle \end{array}\right] \end{array}\right] \\ \text{CONTENT}\ {}_{psoa}\left[\begin{array}{l} \text{RELATION } \textit{determine} \\ \text{AGENT } \boxed{1} \\ \text{THEME } \boxed{2} \end{array}\right] \end{array}\right] \end{array}\right] \end{array}\right]
$$

The lexical entry (95) shows that they are verbs as such. They are not derived from any other category. As a consequence, they undergo the same passive and causative formation as verbs do. The impossibility of the causative and passive formation with the functional verbs follows immediately from the fact that they are verbs, not verbal nouns.

6.3 Ergative Verbal Nouns and Verbal Noun Constructions

As pointed out in the discussion of the passive VNCs, some intransitive nominals may undergo passivization with the functional verb *hata* (to be). In this subsection I argue for the so-called Ergative Hypothesis (or the Unaccusative Hypothesis as it is sometimes called), and show that there are ergative verbal nouns in Korean.

Miyagawa (1989) argues that ergative nominals in Japanese cannot be Case-marked when occurring with the verb *suru* (to do). Miyagawa's claim is based on the following Japanese examples in which some verbal nouns do not allow Case-marking.

(96) Japanese ergative nominals (Miyagawa (1989, 664))

a. tantyoo (birth): $^{?/}$*tantyoo-o suru tantyoo-suru
b. zyoohatu (evaporation): $^{?/}$*zyoohatu-o suru zyoohatu-suru
c. tootyaku (arrival): $^{?/}$*tootyaku-o suru tootyaku-suru
d. ryuukoo (popularity): $^{?/}$*ryuukoo-o suru ryuukoo-suru
e. meytyuu (strike, hit): $^{?/}$*meytyuu-o suru meytyuu-suru

He attempts to explain the ungrammaticality of the Case-marked examples in the middle low in terms of the so-called Burzio's generalization as formulated in (97).

(97) Burzio's Generalization
If a verb assigns Case to its object, then it assigns a θ-role to its subject.

According to him, if the nominal is ergative no external thematic role is transferred to the light verb. If the verb *suru* (to do) has no external thematic role, it cannot assign an accusative Case to the ergative nominal. The examples in the middle low in (96) are ungrammatical because they violate Burzio's generalization.

The parallel nominals in Korean, however, pose an interesting question concerning Case-marking. The Korean counterparts of the Japanese nominals can be Case-marked in the same structure as in (96).

(98) Korean counterparts of the Japanese ergative nominals in (96)
   a. thansayng (birth): thansayng-ul hata
   b. cungpal (evaporation): cungpal-ul hata
   c. tochak (arrival): tochak-ul hata
   d. yuhayng (popularity): yuhayng-ul hata
   e. myengcwung (strike, hit): myengcwung-ul hata

The examples in (98) suggest that one of the following two claims may not be true; either that Miyagawa's claim also holds in Korean or that the nominals in (98) are ergative nominals.[31]

[31] Miyagawa (1989) proposes a scrambling test to distinguish Ergative nominals from Unergative ones. According to him, only Ergative nominals allow a VP-internal numeral quantifier (NQ) under the assumption that the NQ and the related quantified NP must m-command each other. In Korean, however, this test does not seem to be convincing, since we see no difference between the apparent Ergative nominal *tochak* (arrival) in (i) and the Unergative nominal *hapsek* (table sharing) in (ii).

(i) a. saymaulho-ka [Seoul yek-ey sey-tay **tochak**-ul ha-ess-ta].
express train-NOM Seoul station-at three-NQ arrival-ACC do-PAST-DECL
'Three express trains arrived at Seoul station.'

b. *sey-tay, Seoul yek-ey saymaulho-ka **tochak**-ul ha-ess-ta.
three-NQ Seoul station-at express train-NOM arrival-ACC do-PAST-DECL
'Three express trains arrived at Seoul station.'

(ii) a. haksayng-tul-i [ku noin-kwa sey-myeng **hapsek**-ul ha-ess-ta.]
student-PL-NOM the old man-with three-NQ table sharing-ACC do-PAST-DECL
'Three students did table sharing with the old man.'

b. *sey-myeng, ku noin-kwa haksayng-tul-i **hapsek**-ul ha-ess-ta.
three-NQ the old man-with student-PL-NOM table sharing-ACC do-PAST-DECL
'Three students did table sharing with the old man.'

Ahn (1990) also notes the same problem in the Case-marking of the Korean nominals like those in (98). Given the Ergative Hypothesis and the Burzio's Generalization, it seems inevitable to treat the accusative markers in (98) in a different way. Ahn's claim concerning the Case-marking of these nominals is that the accusative Case-marker in (98) is not a Case-marker, but an emphatic delimiter inserted at S-Structure. One of the unattractive points in Ahn's (1990) claim, however, is that he does not present any convincing evidence that the notion of the emphatic delimiter is independently motivated in Korean. In other words, it is unclear in his claim what the emphatic delimiter is.

In this paper, I argue that these nominals are in fact ergative ones and that in Korean there is no difference between ergative nominals and unergative nominals with respect to Case-marking in the VNCs.

To discern ergative nominals from unergative ones, I propose to use passivization with the functional verb *toyta* (to be). (see section 5 for details). In Korean, unergative nominals do not undergo *toyta* (to be) passives, whereas ergative nominals do. This is because *toyta* (to be) as a functional verb subcategorizes verbal nouns which contain a THEME argument. The passivization test below shows that the nominals in (98) are in fact ergative nominals.

(99) unergative verbal nouns and passivization with the FV *toyta* (to be)

a. Kim-i cayulopkey hayngtong-ul ha-ess-ta. (active VNC)
Kim-NOM freely behavior-ACC do-PAST-DECL
'Kim behaves himself freely.'

b. *Kim-i cayulopkey hayngtong-i toy-ess-ta. (passive VNC)
Kim-NOM freely behavior-NOM be-PAST-DECL
'Kim behaves himself freely.'

(100) ergative verbal nouns and passivization with the FV *toyta* (to be)

a. mwul-i ppalli cungpal-ul ha-ess-ta. (active VNC)
water-NOM fast evaporation-ACC do-PAST-DECL
'Water evaporates fast.'

b. mwul-i ppalli cungpal-i toy-ess-ta. (passive VNC)
water-NOM fast evaporation-NOM be-PAST-DECL
'Water evaporates fast.'

These examples lend credence to the assumption that the nominals in (98) are also ergative ones in Korean. At the same time, the existence of ergative nominals in Korean suggests that Miyagawa's (1989) claim does not hold in Korean. Now I will give a sample lexical entry for ergative verbal nouns.

(101) a lexical representation of the ergative verbal noun *cungpal* (evaporation)

$$\begin{bmatrix} \text{PHON /cungpal/} \\ \text{SYNSEM} \begin{bmatrix} \text{LOC} \begin{bmatrix} \text{CAT} \begin{bmatrix} \text{HEAD} \begin{bmatrix}\text{PRED } +\end{bmatrix}_{noun} \\ \text{VAL} \begin{bmatrix}\text{SUBJ } \langle \boxed{1}\ \text{NP}_{\boxed{2}} \rangle\end{bmatrix}_{val} \end{bmatrix}_{cat} \\ \text{CONTENT} \begin{bmatrix} \text{RELATION } \textit{evaporation} \\ \text{AGENT } \textit{unknown} \\ \text{THEME } \boxed{2}\end{bmatrix}_{psoa} \end{bmatrix}_{loc} \end{bmatrix}_{synsem} \end{bmatrix}_{word}$$

The representation in (101) is a tentative and highly simplified one. By this, however, I intend to represent that ergative nouns are syntactically intransitive and semantically transitive. One can derive all three kinds of VNCs from ergative verbal nouns as represented in (101). In particular, they can be passivized by the functional verb *toyta* (to be), since they contain a THEME argument.

6.4 Multiple Verbal Noun Constructions and Some Residual Issues

In this section I list some issues which seem to relate to the VNCs discussed so far, but due to lack of space and time are left open or untouched in this paper. I point out three issues and discuss some possible way to explain them: the issue concerning the multiple occurrence of verbal nouns, the issue concerning the interaction of morphology and syntax, and the issue relating the argument realization within an NP.

Let us look at the first issue. We have discussed so far the cases in which only one verbal noun occurs in a sentence. In these cases all arguments of the verbal noun can be realized at the sentence level. As a consequence, more complements than required occur in the sentence. They may also be Case-marked. They do not raise any problem for the proposal made in this paper. This is because the multiple occurrence of complements is merely a phenomenon in which the argument transfer repeatedly takes place from the embedded verbal nouns. There are, however, sentences in which more than one verbal noun occur in the same sentence and where all arguments of these verbal nouns may be realized at the sentence level. As an example, let us look at the sentence given in (102) in which two verbal nouns, *swuip* (import) and *kumci* (prohibition), occur.[32]

(102) tangkwuk-i [panana]-lul [swuip]-ul [kumci]-lul
government-NOM banana-ACC import-ACC prohibition-ACC
<u>ha-ess-ta</u>.
do-PAST-DECL
'The government did prohibition from doing import bananas.' (lit.)
= 'The government prohibited (the importer) from importing bananas.'

[32] See O'Grady (1992) and Yoon (1991) for the discussion of sentences like (102).

The sentence in (102) is an active VNC in which the functional verb *hata* (to do) combines with two verbal nouns. Note also that all complements except the subject are realized at the sentence level and are Case-marked with accusative Case-markers. This sentence does not deviate from the general Case-marking system given in section 3.4. This fact is further evidenced by the following examples in which other functional verbs are used. For example, the corresponding passive and causative sentences with the functional verbs *toyta* (to be) and *sikhita* (to cause) seem to show the same Case-marking as the VNCs with a single verbal noun.

(103) a. [panana]-ka (tangkwuk-eyuyhay) [swuip]-i [kumci]-ka
banana-NOM government-by import-NOM prohibition-NOM
toy-ess-ta.
be-PAST-DECL

'Bananas were done prohibition from being done import by the government.'
= 'Importing bananas were prohibited from (by the government).'

b. Kim-i [panana]-lul [swuip]-ul [kumci]-lul
Kim-NOM banana-ACC import-ACC prohibition-ACC
sikhi-ess-ta.
cause-PAST-DECL

'Kim caused (the government) to do prohibition (the importer) from doing import bananas.'
= 'Kim caused (the government) to prohibit (the importer) from importing bananas.'

As far as the Case-marking of the arguments is concerned, the multiple occurrence of VNs does not seem to raise any problem in our proposal. However, the proposal needs to be extended in order to explain the realization of the arguments subcategorized by the deeply embedded VNs, since the grammatical function of the arguments of a deeply embedded VN may be affected by the functional verbs.

Let's take an example like in (104). If we assume that the VN *kumci* (prohibition) has an argument frame <AGENT, RECIPIENT, THEME>, it is not surprising that the RECIPIENT argument can be raised to the subject position in the pseudo-passive sentence with the FV *patta* (to get). Interestingly enough, however, the RECIPIENT argument of the VN *kumci* (prohibition) is the AGENT argument of the VN *swuip* (import).

(104) epcatul-i [panana]-lul [swuip]-ul [kumci]-lul pat-ass-ta.
importer-NOM banana-ACC import-ACC prohibition-ACC get-PAST-DECL
'The importer received the prohibition from doing import bananas.'

The example (104) suggests that the NP epcatul (importer) is a shared argument between the VNs *swuip* (import) and *kumci* (prohibition). Note that this NP could be specified on the SUBJ of the VN *swuip* (import). Furthermore, the example in (103a) show that the arguments specified on the COMPS of the embedded VN *panana* (bananas) can be shared between the two VNs. It is important to note that the NP *panana* (bananas) is not the THEME argument of the VN *kumci* (prohibition), but of the VN *swuip* (import). The observations above make possible the following assumption for the multiple VNCs:

- There is a certain correlation between the VN subcategorized by the FV and the embedded VN. The argument structures of two (or more) VNs should be formulated in some way.
- Only transitive VNs can occur at the position immediately followed by the FVs, because intransitive VNs never subcategorize for other elements, including VNs.

The most decisive question in the formation of multiple VNCs seems to be how the argument structures of VNs can be composed, something which should be further examined. The argument structure composition typically comes with grammatical function changing. The AGENT argument of the VN [*kumci*] (prohibition) remains unchanged. The AGENT argument of the VN *swuip* (import), however, becomes the RECIPIENT argument in the argument structure of the composed VN [*swuip*]-[*kumci*]. The THEME argument of *swuip* (import) becomes the THEME argument of the composed argument structure. Assuming that this argument structure composition takes place, the active, passive and causative VNCs can be derived from the composed VN as shown in (105).

(105) a. tangkwuk-i [panana]-lul [swuip]-[kumci]-lul
government-NOM banana-ACC import-prohibition-ACC
ha-ess-ta.
do-PAST-DECL
'The government prohibited (the importer) from importing bananas.'

b. [panana]-ka (tangkwuk-eyuyhay) [swuip]-[kumci]-ka
banana-NOM government-by import-prohibition-NOM
toy-ess-ta.
be-PAST-DECL
'Bananas were prohibited from being imported (by the government).'

c. epcatul-i [panana]-lul [swuip]-[kumci]-lul pat-ass-ta.
importer-NOM banana-ACC import-prohibition-ACC get-PAST-DECL
'The importer received the prohibition from importing bananas.'

This question relates to the second question of the interaction between syntax and morphology. As shown in (102) and (105c), some NPs may form synthetic compounds in which a head-complement relation holds between the elements in their internal structures. In (106a) we see an example in which only one argument of the embedded VN is realized within the NP. This case is extensively examined in the sections above. The most interesting and tricky question concerns sentences like (106b), in which the head-complement relation holds among more than two NPs.

(106) a. tangkwuk-i [panana]-uy [swuip]-ul [kumci]-lul
government-NOM banana-GEN import-ACC prohibition-ACC
ha-ess-ta.
do-PAST-DECL

'The government prohibited (the importer) from importing bananas.'

b. tangkwuk-i [panana]-[swuip]-[kumci]-lul ha-ess-ta.
government-NOM banana-import-prohibition-ACC do-PAST-DECL

'The government prohibited (the importer) from importing bananas.'

One might argue that this question is solved in terms of lexical rules which compose the sequence of the syntactic strings to a morphological unit. This approach, however, seems to face fatal difficulties. Among others, it may overgenerate sentences (see section 7.2 for the comparison with the proposal made here and lexical rule approaches). As suggested above, a correct approach should be based on the argument structure of each element. I leave this to another paper on this theme.

Before concluding this section, I point out one more question concerning the distribution of the arguments. We have argued that some of the arguments of VNs can be realized within the NP. The NP-internally realized argument is marked with the genitive Case-marker uy in Korean and no in Japanese. Look at the examples in (107), however, in which the Korean counterpart of the Japanese sentence is ungrammatical.

(107) a. Taroo-ga [eigo-no benkyoo]-o shita. (Japanese)
Taroo-NOM English-GEN study-ACC do-PAST-DECL

'Taroo studied into English.'

b. *Kim-i [yenge-uy kongpwu]-lul ha-ess-ta. (Korean)
Kim-NOM English-GEN study-ACC do-PAST-DECL

'Kim studied into English.'

The examples above suggest that there appears to be a language-specific constraint on the distribution of the arguments. Even though we have not focussed on the examples of this kind and do not have any principled answer to this question at moment, it does not raise any essential problem to our proposal here, since the number of the impossible sentences is highly restricted

7 Comparison with Other Approaches

7.1 Approaches in Other Frameworks

7.1.1 θ-Transparent Nouns and Light Verbs

The Japanese counterpart of the Korean active VNCs has received detailed discussions in G&M (1988) and Grimshaw (1990). A crucial feature of their proposal is the notions of the θ-transparent noun and the light verb. Following Jespersen (1954) and Cattell (1984), G&M (1988) call the verb *suru* (to do) a light verb

(LV) which corresponds to *hata* (to do) in Korean. According to them, LV is thematically 'incomplete' or 'light' by nature. Their hypothesis concerning the process of the complex predicate formation may be summarized as follows:

(108) a. Nouns immediately preceding LVs are θ-transparent so that they can assign θ-roles outside their own maximal projection.
b. The verb *suru* (to do) subcategorizes for and Case-marks a direct object NP.
c. Some or all arguments of the noun occurring with *suru* (to do) must be transferred to *suru* under a set of restrictions, a process which they call argument transfer. There can thus be two θ-markers, nouns assigning θ-roles to arguments inside NP and *suru* (to do) to arguments outside NP.

Let us consider the notion of θ-transparent nouns. According to (108a), the notion of the θ-transparent noun is understood as the noun which can assign θ-roles outside its maximal projection. The notion is crucial in G&M (1988), since they attempt to explain in terms of these notion why arguments of the noun co-occurring with the verb *suru* (to do) can be realized at the sentence level. Consider the following topicalization test they present as a criterion for a distinction between θ-transparent and θ-opaque NPs. As shown in (109) and (110), topicalization is possible for θ-opaque nouns, whereas it is impossible for θ-transparent nouns.

(109) θ-opaque object, topicalization is possible (=(6), G&M (1988))
a. John-ga [[ookami-ga kuru-to]-no hookoku]-o <u>wasureteita</u>.
John-NOM wolf-NOM come-COMP-GEN report-ACC had forgotten
'John had forgotten the report that the wolf was coming.'
b. [[ookami-ga kuru-to]-no hookoku]-wa John-ga wasureteita.
wolf-NOM come-COMP-GEN report-TOP John-NOM had forgotten
'John had forgotten the report that the wolf was coming.'

(110) θ-transparent object, topicalization is impossible (=(7), G&M (1988)
a. John-ga [ookami-ga kuru-to] hookoku-o <u>shita</u>.
John-NOM wolf-NOM come-COMP report-ACC suru
'John did the report that the wolf was coming.'
b. *hookoku-wa John-ga [ookami-ga kuru-to] <u>shita</u>.
report-TOP John-NOM wolf-NOM come-COMP suru
'John did the report that the wolf was coming.'

Their claims amount to saying that the noun *hookoku* (report) is θ-opaque in positions other than those subcategorized by *suru* (to do). Thus, only LVs co-occur with θ-transparent NPs and other Japanese verbs take only θ-opaque NPs (G&M (1988: 208).

If their claim holds also in Korean, only arguments of the noun immediately preceding the verb *hata* (to do) can be realized at the sentence level. This prediction, however, is not correct. I put forward an argument against G&M's assumption on the θ-transparent property of the nouns as a motivation for the argument transfer.

Consider the following sentences which suggest that the θ-transparent nouns may not be restricted to the position immediately preceding *hata* (to do). For discussion purpose, we regard the verb *hata* (to do) corresponding to *suru* in Japanese as LV. Note that in (111) more than one noun occurs as a θ-transparent noun. The nouns swuip (import) and kumci (prohibition) are θ-transparent in G&M's (1988) sense, since they are not subject to topicalization as illustrated in (112).

(111) a. tangkwuk-i [panana-uy swuip]-ul [kumci]-lul
government-NOM banana-GEN import-ACC prohibition-ACC
ha-ess-ta.
do-PAST-DECL
'The government prohibited (the importer) from importing bananas.'

b. tangkwuk-i [panana]-lul [swuip]-ul [kumci]-lul
government-NOM banana-ACC import-ACC prohibition-ACC
ha-ess-ta.
do-PAST-DECL
'The government prohibited (the importer) from importing bananas.'

(112) a. *[swuip]-un tangkwuk-i [panana]-lul [kumci]-lul
import-TOP government-NOM banana-ACC prohibition-ACC
ha-ess-ta.
do-PAST-DECL
'The government prohibited (the importer) from importing bananas.'

b. *[kumci]-nun tangkwuk-i [panana]-lul [swuip]-ul
prohibition-TOP government-NOM banana-ACC import-ACC
ha-ess-ta.
do-PAST-DECL
'The government prohibited (the importer) from importing bananas.'

In (111a) the object of the first bold-faced noun is realized inside NP. The accusative Case-marker attached to the object *panana* (banana) in (111b), however, indicates that it is realized outside NP. If G&M's distinction between θ-transparent and θ-opaque nouns is also valid in Korean, then the noun *swuip* (import) in (111b) must be θ-transparent without being subcategorized by the verb *hata* (to do). The corresponding Japanese sentences are not generally allowed, since in Japanese the sequence of more than two accusative Case-marked NPs is ruled out due to the Double-o Constraint (quoted from Dubinsky (1989, p.99)):

(113) A derivation is marked ill-formed if it terminates in a surface structure which contains two occurrences of NPs marked with o, both of which are dominated by the same VP node.

Korean differs from Japanese in this respect. Korean sentences, like in (111b), are highly productive. Thus, the notion of θ-transparent nouns as a motivation for argument transfer does not seem to be properly motivated when applied to Korean. Furthermore, it is worth noting that the θ-transparent property of the nouns in G&M's sense may not be restricted to the object position, nor to the position subcategorized for by *hata* (to do).

(114) a. yosai [panana]-uy [swuip]-i elyep-ø-ta.
nowadays banana-GEN import-NOM difficult-PRES-DECL
'Nowadays, importing bananas is difficult.'

b. yosai [panana]-ka [swuip]-i elyep-ø-ta.
nowadays banana-NOM import-NOM difficult-PRES-DECL
'Nowadays, importing bananas is difficult.'

On the other hand, their approach seems to face some theoretical difficulties. In light of their theoretical assumptions, G&M's basic assumption about the verb *suru* (to do) turns out to be a violation of a version of Burzio's generalization as formulated above in (97).

According to G&M, the verb *suru* (to do) subcategorizes and Case-marks a direct object NP. They argue further that 'the key difference between do and *suru* is that *suru* is transitive, so it can combine with NPs for θ-role assignment' (G&M 1988: 211). Note, however, that according to G&M (1988), the verb *suru* (to do) does not have a subject NP which could receive a θ-role. Furthermore, the Projection Principle (Chomsky 1981: 29) prohibits the movement of an NP from a θ-bar position (i.e. a position to which no θ-role is assigned) to a θ-position. As a result, the subject position of the verb *suru* would be left empty; it would be occupied neither through any moved NP nor through any base-generated NP. Therefore, their assumption about the verb *suru* (to do) per se seems to be problematic.

A way out of the problem might be to assume that subject argument must be transferred away from the argument structure of the noun subcategorized for by the verb *suru*. This is what G&M in fact have proposed as a solution. According to their proposal, some or all arguments of the noun must be transferred to *suru* under a set of restrictions (G&M 1988: 215):

(115) a. At least one argument apart from the subject must be outside the NP.

b. The subject argument must always be outside the NP.

c. For nouns that take a THEME and a GOAL, if the THEME argument is realized outside NP, the GOAL must also be realized outside NP.

Suppose that only some arguments of the noun are transferred to the verb *suru* (to do). In this case there are two θ-markers; nouns assigning θ-roles to arguments inside NP, and *suru* (to do) assigning θ-roles to arguments outside NP. When all arguments of the noun are transferred to the verb *suru*, then there is only one θ-marker, namely the verb *suru*. They call this process argument transfer. In particular, the first cases are called a break-up or splitting process of argument structures that is evidently unidirectional, namely only from nouns to *suru*.

It should be pointed out that, with the restriction in (115), Burzio's Generalization is still violated. This is because it is unclear which element θ-marks the subject. We could say that this problem is a theoretical leakage in G&M (1988). By saying that the subject argument must always be outside the NP (cf. (115b)), they explicitly assume that the subject argument is selected by the noun. According to Burzio's Generalization, however, the subject argument is assigned its θ-role by the verb *suru* (to do). What is still unclear concerns their notion of subject argument. If the statement 'selected by noun' means 'assigned θ-role by a noun', then the subject argument is assigned θ-role twice. This is a violation of the θ-Criterion (Chomsky (1981, 36)). On the other hand, if the selection does not mean a θ-role assignment, the subject argument is only assigned its θ-role by the verb *suru* (to do). In this case, then, no violation of Burzio's Generalization would result any longer, since the verb *suru* (to do) θ-marks the subject argument of the noun. Note, however, that this way out leads to another serious problem, namely the violation of the locality condition (see section 2.4).

For the purposes of further discussion, suppose that G&M's proposal violated neither Burzio's Generalization, nor θ-Criterion, nor the locality condition. Consider then what the result would be with so-called ergative nouns, whereby no subject argument is given at D-structure. Given standard assumptions regarding ergative verbs such as arrive and intransitive break in English, argument in subject position at S-structure is in fact a D-structural object. According to Miyagawa (1989), the ergativity is also observable in Japanese. For example, the Japanese verb toochaku *suru* (to arrive) and its nominal counterpart *toochaku* (arrival) show ergativity. Observe the example in (116).

(116) Japanese ergative nominals and Case-marking (=(28), G&M 1988: 217)

a. Densha-wa Uenoeki-ni toochaku-o <u>shita</u>.
train-TOP Ueno station-to arrival-ACC suru
'The train arrived at Ueno station.'

b. ?Densha-wa [Uenoeki-e-no toochaku]-o <u>shita</u>.
train-TOP Ueno station-to-GEN arrival-ACC suru
'The train arrived at Ueno station.'

G&M assume that *toochaku* (arrival) has two arguments, one of which is a locative argument. G&M cite the examples to show that at least two arguments must occur outside the NP, as stipulated in (115a). The examples, however, cast doubt as to the way in which the noun *densha* (train), which presumably occurs in the object position of *toochaku* (arrival) at some level (most typically at D-structure), becomes the subject of the verb *shita* (to do). A somewhat simplified D-structure tree is illustrated in (117).

(117) a simplified D-structure tree for (116a)

If *toochaku* (arrival) were a verb, then the movement of the noun *densha* (train) from the object position to the subject position might be explained by the Case filter, as is generally assumed in PPT for ergative and passive verbs. It is not clear, however, whether or not and how the Case filter works in the NP-structures. Thus, if the Case filter does not work inside NP and no other ad hoc assumptions are made to raise the object of the noun to the subject NP, the structure in (117) turns out to be a case where the verb *suru* (to do) does not have any subject at all. This is a direct consequence from Miyagawa's argument that the noun *toochaku* (arrival) is ergative. The examples in (116) again present a serious challenge to G&M's (1988) proposal, since there is no subject to be transferred at the cost of the restriction (115).

Now let us consider some empirical problems concerning the restriction of argument transfer shown in (115). One of the consequences of the restriction (115) is that at least two arguments including the subject must be realized outside the NP. The Japanese examples in (118), however, show that only one argument – subject – is outside NP.

(118) a. Taroo-ga [zosei-no heikin-zyumyoo-no benkyoo]-o
Taroo-NOM women-GEN average life expectancy-GEN study-ACC
shita.
suru
'Taroo studied the average life expectacy of women.'

b. Taroo-ga [$_{NP}$ suugaku-no benkyoo]-o suru (Miyagawa
Taroo-NOM mathematics-GEN study-ACC suru
1987: 34)

'Taroo will do studying of mathematics.' (lit.)

Suppose the noun *benkyoo* (study) has two arguments. According to (115), both arguments must be realized outside the NP subcategorizing them. The examples in (118) show that only subject argument occurs outside the maximal projection of the noun *benkyoo* (study), which clearly obviates the restriction in (115a).

Korean Data provide more striking evidence against G&M's claim in (115). Since no argument apart from the subject occurs outside the NP, (119) is again a counterexample to the postulation (115).

(119) Kim paksa-ka ku chayk-uy penyek-ul ha-ess-ta.
Dr. Kim-NOM the book-GEN translation-ACC do-PAST-DECL
'Dr. Kim did translation of the book.'

Secondly, their claims do not cover all the variations of the VNCs discussed so far. It is difficult to see how their claims are applied to passive and causative VNCs, to the incorporated VNCs and the lexicalized verbs with the functional verb *hata* (to do).

To conclude this subsection, the basic problem in G&M (1988) is raised by the question in what sense it can be said that θ-transparent nouns and light verbs θ-mark the arguments appearing outside NP. As H.-S. Han (1988) points out, it is not clear whether their notion of argument transfer is a syntactic or lexical operation.

One of the basic ideas of G&M (1988), however, is further advanced in this paper. The discussion here is indebted to their observation that the argument structures of VNCs are basically inherited from the nominal parts. Their claim that the argument structure of a lexical item, be it the external or internal argument, should be hierarchically structured is also supported by the discussion in this paper.

7.1.2 Verb Raising

We have argued that VNCs are composed of verbal nouns and functional verbs. In my approach we need not discuss any notion of syntactic movement like of verb or noun raising. H.-S. Han (1988) proposes an analysis of VNCs which is highly contradictory to my own analysis in this paper. Because his initial observation is very different from that of mine, I will briefly introduce his basic observation and ideas for discussion purposes. His claim is based on the observation that ''noun-verb" complex predicates are basically verbs in which the morphological boundary between the nominal part and the verbal part is not strong. As a consequence, the verb *hata/suru* (to do) alone can undergo verb raising, leaving the nominal part behind. He calls his approach Verb Raising, since the verb *hata* (to do) is raised to the INFL position. Let us take an example. According to him, the D-structure and S-structure of the sentence in (120) are (121a) and (121b).

(120) Chelswu-ka cip-ul swuli-lul ha-ess-ta. (= (19),
John-NOM house-ACC repair-ACC do-PAST-DECL
Han (1988, p.574))

'Chelswu remodelled his house.'

(121) a. the D-structure of (120) b. the S-structure of (120)

He argues that the verb *swuliha* (to repair) assigns the object *cip* (house) the accusative Case and '*swuli* (repair) is marked with accusative due to (sic !) the raised *ha* (to do)' (Han 1988: p.575). He further argues that if the verb swuliha (to repair) undergoes Verb Raising, the sentence in (122) results which we call the incorporated VNCs.

(122) Chelswu-ka cip-ul swuli<u>ha-ess-ta</u>. (= (22), Han (1988, p.575))
John-NOM house-ACC repair-PAST-DECL
'Chelswu remodelled his house.'

Han's (1988) proposal, as he himself presents, is motivated by the observation that the G&M's (1988) approach leaves many theory-internal problems. His proposal, however, comes across some fatal theory-internal problems itself. I point out some of them below.

The first problem in his proposal concerns the categorial status of swuliha (to repair). If it were V as he himself illustrates in (121a) (= (20) of Han (1988: 575)), the structure would violate some version of the Case Resistance Condition (Stowell (1981)) since a part of the Case-assigning category V receives a Case. Furthermore, we do not know how a part of the category V can receive a Case. If it were N, as he assumes elsewhere (Han 1988: p.573), the object NP *cip* (house) would result in a violation of the Case Filter or the Visibility Condition (Chomsky 1986), since *cip* (house) is θ-marked by *swuliha* (to repair) but can not be assigned accusative Case by it.

The second problem relates to Case-marking of the subject. In Han's claim (1988: 573), the verb *hata* (to do) assigns accusative Case to the remaining nouns without assigning them θ-roles. Given this claim, two questions are immediately raised. One is how the subject is assigned the nominative Case, since he assumes that the element in INFL *hata* (to do) does not assign a nominative Case to the subject, but an accusative Case to the object. Furthermore, it is clear not what the motivation of the assumption is that *hata* (to do) assign an accusative Case without assigning any θ-role.

The third problem in Han's (1988) approach comes from the modifier mismatching phenomena as he himself acknowledges. As discussed in section 6.1, when VNs are incorporated into functional verbs, adjectives cannot modify the VNs. In Han's (1988) approach, modification of VNs by adjectives is completely excluded, because there is no noun at all in his structure (see the structures in (121)).

The fourth problem is found in the examples in which some of the arguments of VNs are realized within the maximal projection of the VNs. Look at the example given in (119), repeated in (123).

(123) Kim paksa-ka ku chayk-uy penyek-ul ha-ess-ta.
Dr. Kim-NOM the book-GEN translation-ACC do-PAST-DECL
'Dr. Kim did translation of the book.'

This problem is a direct consequence of his basic assumption that *penyekha* (to translate) is a verb and Korean and Japanese verbs never assign a genitive Case.

The fifth problem is raised by the empirical data in which some verbs of the form "noun-*hata* (to do)", whose structures are apparently the same as those of VNCs, cannot be separated from each other. Note that we have dealt with these verbs as lexicalized ones (see section 6.2).

(124)
a. cengha- 'decide' *ceng-ul ha-
b. phiha- 'avoid' *phi-lul ha-
c. phayha- 'lose' *phay-lul ha-
d. kwuha- 'seek' *kwu-lul ha-

Finally it should be pointed out that Han's (1988) analysis is confined only to active VNCs with the functional verb *hata/suru*. It seems unclear how his proposal can be extended to cover all the variants of VNCs.

7.2 Lexical Rule Approaches in HPSG

There are a few proposals for VNCs within HPSG in Korean linguistics (M. Lee (1992), S.-J. Chang (1993), among others). Most of them intensively use lexical rules for the description of VNCs. In recent years, however, many theoretical problems were observed concerning lexical rules. In this subsection I briefly discuss some problems of the lexical rule approaches and compare them with my own.

Lexical rules are used in almost all grammar frameworks. The notion of lexical rules depends in each framework on some different degree of generative power and on the operating domain. It is adopted also in HPSG to reduce the lexical redundancies in the organization of the lexicon (for example in HPSG 1, HPSG 2 and Flickinger (1987)). Even within HPSG there seem to be many different views on the lexical rules. Despite their linguistic motivations and empirical usefulness, they sometimes raise theoretical problems.

Some of the open questions relate to the generative power of lexical rules, among others. Carpenter (1991) points out, for example, that grammars like the versions of HPSG with lexical rules may generate arbitrary recursively enumerable languages. According to him, the addition of lexical rules leads to systems in which it is not possible to decide effectively whether a string is accepted by a grammar (Carpenter (1991, p.301). Some problems also concern the nature of lexical rules. They can be viewed either as procedural processes or as declarative processes. As P&S (1987, p.210) point out, the procedural interpretation of lexical rules is more effectively used in the lexicon. If they are used as procedural processes, it seems difficult to decide which property the output of the lexical rules has. This is partly because, unlike feature structures, lexical rules are not generally sorted or typed; and partly because no logical relations like partial ordering holds between lexical rules, as Krieger (1991) points out. If they are used as declarative processes, most of the problems so far may be avoided. They can then be merely expressions of linguistic generalizations which are evidently bidirectional. Consequently, they may not make a great contribution in organizing the lexicon effectively.

Even if we leave aside the general theoretical rebulousness of lexical rules, they seem to have many empirical problems. Most of these are concerned with the possibility that they may overgenerate ungrammatical strings. One might need to constrain the generative power of lexical rules. For the purpose of discussion, let us take a sample lexical rule to derive THEME passive VNCs from active VNCs. The lexical rule in (125) is given for an illustration purpose. Some lexical rules which are essentially the same as in (125) are proposed in M. Lee (1992, chap.6) and in S.-J. Chang (1993) in the framework of HPSG 1.

(125) a sample lexical rule for passive VNCs with *toyta* (to be)

$$\begin{bmatrix} \text{PHON } /\boxed{1}\text{-hata}/ \\ \text{SYNSEM} \begin{bmatrix} \text{LOC} \begin{bmatrix} \text{CAT} \mid \text{SUBCAT} \left\langle \boxed{2} \mid \boxed{3} \right\rangle \\ \text{CONTENT } \boxed{4} \end{bmatrix} \end{bmatrix} \end{bmatrix}_{basis} \Rightarrow$$

$$\begin{bmatrix} \text{PHON } /\boxed{1}\text{-toyta}/ \\ \text{SYNSEM} \begin{bmatrix} \text{LOC} \begin{bmatrix} \text{CAT} \mid \text{SUBCAT} \left\langle \left(\boxed{3}\, [\textit{-uyhay}] \right), \ldots, \boxed{2} \right\rangle \\ \text{CONTENT } \boxed{4} \end{bmatrix} \end{bmatrix} \end{bmatrix}_{passive},$$

where $\boxed{1} \in$ {*sokay* (introduction), *ihay* (understanding), *choday* (invitation), ...}

The lexical rule in (125) is viewed as a procedural one, since it generates a passive form "nominal+*toyta*" by taking a transitive lexical form "nominal+*hata*". In the course of application the object and the subject argument of the input specification become the subject and the oblique argument of the output specification, respectively. Thus, this lexical rule is intended to capture the fact that the

THEME passive VNCs "nominal+*toyta*" are derived from the transitive active VNCs "nominal+*hata*". Note, however, that the lexical rule in (125) has two empirical problems.

The first problem is related to overgeneration. As pointed out in section 6, some "nominal+*hata*" are already lexicalized so that they never allow the passive or causative formation with functional verbs. It seems difficult to see how the lexical rule in (125) captures this fact.

(126) lexicalized VNCs and passive

a. Kim-i nonmwuntheyma-lul ceng-ha-ess-ta.
Kim-NOM thesis theme-ACC determine-do-PAST-DECL
'Kim determined the thesis theme.'

b. *nonmwuntheyma-ka Kim-eyuyhay ceng-toy-ess-ta.
thesis theme-ACC Kim-by determine-be-PAST-DECL
'The thesis theme was determined by Kim.'

The second problem is the unsatisfactory generalization. The lexical rule in (125) is not generalized enough to capture the fact that ergative verbal nouns which are apparently intransitive can form THEME passives with the FV *toyta* (to be). It cannot capture this fact because it only derives passives from transitives.

(127) ergative nominals and passive

a. saymaulho-ka Seoul yek-ey tochak-ul <u>ha-ess-ta</u>.
the express train-NOM Seoul station-at arrival-ACC do-PAST-DECL
'The express train arrived at Seoul station.'

b. saymaulho-ka Seoul yek-ey tochak-i <u>toy-ess-ta</u>.
the express train-NOM Seoul station-at arrival-NOM be-PAST-DECL
'The express train arrived at Seoul station.'

All the facts alluded to above can be captured in my proposal. It seems still possible to present a lexical rule which can capture these facts. One of the most feasible solutions may be that one takes lexical rules based on the thematic roles, not on the syntactic subcategorization information or on the obliqueness hierarchy.

Compared with my proposal, the lexical rule approach based on thematic roles may achieve the same descriptive adequacy as the proposal here does. It is unclear, however, how the locality condition is satisfied in the lexical approach, be it based on obliqueness hierarchy or on thematic roles. Furthermore, it seems difficult in the lexical rule approaches to capture the fact that the arguments are basically inherited from the verbal nouns.

8 Conclusion

In this paper I have discussed how some nouns designated as verbal nouns (VNs) are combined with functional verbs like *hata* (to do) to form "noun-verb" complex predicates. For this, I pursued two parallel issues: one is empirical and the other theoretical.

From the empirical point of view, I made the following observations.

- In Korean and Japanese, there is a uniquely distinct set of nouns called verbal nouns with their own argument structures. These have been shown to be different from deverbal or gerundive nouns. Some other constructions which have been misleadingly regarded as of the same category have turned out to be different from those with verbal nouns.

- These verbal nouns form a complex predicate with a particular verb called functional verb (FV). They require an FV to function as a genuine verb so that they can take such verbal features as active, passive, or causative. This requirement is due to the typological peculiarities of Korean or Japanese.

- The compounding of a verbal noun with a functional verb is strictly constrained by their argument structures. They are combined with each other only when the verbal noun satisfies the subcategorization requirements of the functional verb. This claim enables us to explain why some formations of the complex predicates are possible and some others are to be blocked.

- Some of the arguments originally selected by the verbal nouns may be realized at the sentence level. The aspect of realization of the arguments supports the assumption that the argument structure should be hierarchically organized.

On the basis of these empirical observations, I have taken up some theoretical issues within the framework of HPSG. Basically I argue against those approaches that adopt lexical rules. Instead, I have proposed structure-sharing between a VN and an FV and the transfer of argument structure from VN to FV with the following implementations.

- The inheritance of arguments does not involve Case-specification.

- The information specified in a complement can be further inherited by adopting an operation originally proposed by Hinrichs & Nakazawa (1993).

- I tried to show how the Boolean feature LEX can block Case-marking and be effectively used for incorporation phenomena.

- The notion of structure sharing can be used to describe the argument transfer mechanism.

- In some languages like Korean, Case-specifications should be encoded in the Immediate Dominance Schemata.

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