Postverbal Subject in Thai

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0. Introduction

In this paper I provide an analysis of the postverbal subject in Thai. Thai is described as a SVO language by Hawkins (1983) and by Thai grammarians such as Surintramont (1979), Sriphep (1972), Waroamasikhdhit (1972), Kullavanija (1968), Chaiyaratana (1966) and in Thai traditional grammar books. However these analyses seem to be problematic due to the peculiar characteristics of such verbs as mii 'exist', kEEt 'occur', duumlan 'seem' as well as verb-like adjectives, which do not require any element or unit at all in the position right before them in a declarative sentence. To my knowledge these particular verbs have been analyzed simply as taking a non-overt subject or a deleted subject. This phenomenon raises the following questions: Do these verbs and verb-like adjectives require subjects? If so, where are they located? If not, what types of verbs are they? Are some sentences spoken in isolation in Thai are subjectless?

In this analysis, I focus on the occurrence of the existential verb mii in a sentence spoken in isolation. I first present the forms of subject and object of intransitive and transitive verbs, including an element or a unit in the post-position of verb mii 'exist'. I argue that the mii-construction is a sentence, not a verb phrase. Then I argue that the element following the verb mii 'exist' is a subject, not a direct object, of this verb. Hence there are two subject types in Thai: preverbal and postverbal, with the subject-verb (SV) structure for the former and the verb-subject (VS) for the latter. The paper ends with an application of HPSG theory (Pollard and Sag 1987) to the SV and VS structures in this language. I give the mii 'exist' and kEEt 'occur' constructions as examples for the VS structures.

I divide the paper into five sections. Section 1: The Notion 'Subject'; Section 2: Background of the Thai Language: the points relevant to this particular analysis; Section 3: The Analysis; Section 4: Application of HPSG Theory to the SV and VS Structures in Thai; and Section 5: Conclusion.

1.0 The Notion 'Subject'

To define the term 'subject' for my analysis, I follow Keenan's (1976) properties of a basic subject of a basic sentence. Keenan lists thirty properties which subjects characteristically possess and three types of characteristic subjects. The properties may be pragmatic, semantic or syntactic. He presents four major categories of basic subject properties: (1) autonomy properties, which include independent existence, indispensability and autonomous reference; (2) case-marking properties; (3) semantic role; and (4) immediate dominance. He divides the characteristics of subject into three types: coding properties, behavior properties, and semantic properties. He further postulates that certain subject properties are more difficult for derived subjects to acquire than others and hypothesizes a Promotion Hierarchy, claiming that coding properties are the most easily

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transferred, while the semantic ones are the most difficult to acquire.

Despite the availability of a number of properties, not all can be taken as valid tests for determining the grammatical relation of a postposition of the verb mii. One reason is that Thai is a non-inflectional language; there are no case markers for subjects and objects; nor is there agreement between a verb and a subject or between a verb and an object. Secondly, both subject and object in Thai share several properties. For instance, both can be deleted or omitted, topicalized, questioned, relativized, as well as being a possible controller of stipulated coreference. The only properties left to be employed as valid tests to find the exact status of the postposition of the existential verb mii are imperativization, passivization and VP topicalization. I focus in this paper the type of subject which Keenan describes as a basic subject, not a derived one.

2.0 Background of the Language

In Thai, the verb form does not agree with its subject in person, number and gender; nor does it change according to the tense and time of an event or an action. For example, (la) and (lb) show that verb thamqaan 'work' is invariant regardless of the particular personal pronoun and the temporal expression. Although the verb is uninflected, it is accompanied by adverbs which indicate the time.

(1) a. Is khâw
   thamqaan thûkwan /mîawaanâññi/phûññi
   he/she/they (m/f) work everyday/yesterday/tomorrow evening
   'He/she/they (m/f) work(s) everyday' OR
   'He/she/they (m/f) worked yesterday' OR
   'He/she/they (m/f) will work tomorrow evening'

   b. Is čân/raw/khun thamqaan thûkwan /mîawaanâññi/phûññi
tOOnyenj
   I/we/you work everyday/yesterday/tomorrow evening
   'I/we/you work everyday' OR
   'I/we/you worked yesterday' OR
   'I/we/you will work tomorrow evening'

The evidence above thus shows that properties of subjecthood or inflection marking the subject is not reflected in the verbal morphology. Similarly, there is no agreement between a verb and an object in Thai, as shown in (2).

(2) Is čân râk mûx/phûññx/khâw
   'I love mother/parent/ she/she/they (m/f)'
   'I love mother/parents/her/him/them (m/f)'

Subject and object in almost all sentences spoken in isolation in Thai are indicated by position. That is, a subject occurs right before a verb, while a direct object immediately after a transitive and a ditransitive verb and a prepositional object after a preposition.

3.0 Analysis

To argue that there is a postverbal subject in Thai, I divide Section 3 into three subsections: 3.1 illustrates the forms of subject, object and the postposition of the verb mii. Here I show which subject or object forms occur with mii. In 3.2 I argue for the sentencehood of the mii construction. In other words, this construction is not a verb phrase. Nominalization, complementization and imperativization are employed to support this argument. Based on the argument in 3.2, I argue in 3.3 that the postposition of the verb mii is a subject, not a direct
object of this verb. Here I use imperativization, passivization and topicalization of VP to support the subjecthood of this element.

3.1 The Forms of Subject and Object in Thai

In this section I show that NP, S and S' all function as both subjects and objects in intransitive and transitive Thai sentences. I also present their occurrences as the postposition of the mii construction. In this analysis I focus on transitive, intransitive, and the mii construction.

3.1.1 NP

(3a) and (3b) show that NP phaayú rx11 'strong storm' functions as a subject of INTV kEEtkh1n 'occur' and TV thamlaii 'destroy' respectively.

(3a) INTV:
| [s [NP phaayú rx11] kEEtkh1n bOybOy] |
| storm strong occur often |
| 'A strong storm often occurs' |

(3b) TV:
| [s (NP phaayú rx11) thamlaii muubaan mii] |
| storm strong destroy village this |
| 'A strong storm destroyed this village'

(3c) shows that mii 'exist' takes NP phaayú rx11 'strong storm' in the object position only.

(3c) mii 'exist':
| [mii [NP phaayú rx11]] |
| exist storm strong |
| 'There is a strong storm' |
| *[l [NP phaayú rx11] mii] |

Comparing (3c) with (3d) below, we see that both existential verb mii and TV kláat 'hate' have NP phaayú rx11 'a strong storm' in the object position. However, in (3d) phaayú rx11 is the object.

(3d) TV:
| [s [NP čán kláat [NP phaayú rx11]]] |
| I hate storm strong |
| 'I hate a strong storm'

3.1.2. Complementized Sentence (S')

Complementizers which are usually used in Thai are kaanthi and thi. Some verbs take both, while others allow one of them. (4a) and (4b) show the occurrence of S' as a subject of INTV kEEtkh1n 'occur' and TV thamhái 'cause/make' respectively.

(4a) INTV:
| [s [S' kaanthi [s phaayú phát rx11] kEEtkh1n bOybOy] |
| comp:that storm blow strong occur often |
| 'That storms blow strongly often occurs' |

(4b) TV:
| [s [S' khaanthi [s phaayú phát rx11] thamhái s[ čán klua]] |
| comp:that storm blow strong make/cause I scare |
| 'That the storm blows strongly makes me scared' |
(4c) and (4d) show the occurrence of S' in the object position of the TV hën ‘see’ sentence and the mii construction respectively.

(4)

c.  
\[I_s \text{cán hën} \text{ PAUSE } [s,\text{thih}/\text{kaanthîi } l_s \text{ phaayú phât rxñ}]]\]  
I see PAUSE comp:that  
storm blow strong  
‘I saw that the storm blew strongly’

d.  
[mii \text{ PAUSE } [s,\text{thih}/\text{kaanthîi } l_s \text{ phaayú phât rxñ}]]\]  
exist PAUSE comp:that  
storm blow strong  
‘That a storm blows strongly exists’

Similar to TV hën ‘see’, the mii takes S' with Comp thii, and a pause between S' and mii itself. In contrast to TV hën, this verb also takes S' with Comp kaanthîi right after it.

3.1.3. Sentence (S)

(5a) and (5b) show the occurrence of S as a subject of INTV kEtkhIn ‘occur’ and TV thamlaai ‘destroy’ respectively.

(5)

a.  
\[l_s l_s \text{ phaayú phât rxñ} kEtkhIn \text{ bôybôy}]]\]  
storm blow strong occur often  
‘[Storms blow strongly] often occurs’

b.  
\[l_s l_s \text{ phaayú phât rxñ} \text{ thamhál } l_s \text{ cán klual}]]\]  
storm blow strong make I scare  
‘[Storms blow strongly] scares me’

Like TV hën ‘see’ in (5c), mii takes S in the object position, as shown in (5d).

(5)

c.  
\[l_s \text{cán hën} l_s \text{ phaayú phât rxñ}]]\]  
I see storm blow strong  
‘I saw the storm blow strongly’

d.  
[mii l_s \text{ phaayú phât rxñ}]]\]  
exist storm blow strong  
‘There are storms (that) blow strongly’

To sum up, NP, S and S' occur right after mii, or occur as the postpositions in the mii construction. Such elements occur as subjects of both INTV and TV as well as objects of TV. Verb mii allows Comps thii and kaanthîi in S' which follows it. However, only S' with Comp thii, not kaanthîi, is taken by TV hën ‘see’ as its object. The selection of Comp(s) thus depends on certain characteristics of certain verbs.

3.2 Sentencehood of the mii ‘exist’ Construction

In Thai all verbs and verb phrases except copula khil ‘be [-Locative]’ can be nominalized, and all sentences can be complementized, hence becoming S'. The nominalization morpheme (Nom) for verbs is kaan, and the complementization morphemes (Comps) for sentences are kaanthîi and thii. To argue that the mii-construction is a sentence, I illustrate nominalization of INTV, TV and verb
mii ‘exist’ in 3.2.1, complementation of sentences and the mii ‘exist’ construction in 3.2.2 and imperativization in 3.2.3.

### 3.2.1 Nominalization

Illustrated in (6) is nominalization of verbs in Thai.

<table>
<thead>
<tr>
<th>Type</th>
<th>Nominalization</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td>kaan + [INTV] kEEtkhIn -&gt; [VB.N kaan kEEtkhIn]</td>
<td>‘happening’</td>
</tr>
<tr>
<td>b.</td>
<td>kaan + [TV] thamlaai -&gt; [VB.N kaan thamlaai]</td>
<td>‘destroying’</td>
</tr>
<tr>
<td>c.</td>
<td>kaan + [v mii] -&gt; [VB.N kaan mii]</td>
<td>‘existing’</td>
</tr>
</tbody>
</table>

Nominalization of verb phrases is shown in (7).

<table>
<thead>
<tr>
<th>Type</th>
<th>Nominalization</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td>kaan + [INTVP] kEEtkhIn bOybOy] -&gt; [INTVP.NP kaan kEEtkhIn bOybOy]</td>
<td>‘Occurring often’</td>
</tr>
<tr>
<td>b.</td>
<td>kaan + [TVp] mii phiw -&gt; [TVB.NP kaan mii phiw]</td>
<td>‘Having a fine complexion’</td>
</tr>
<tr>
<td>c.</td>
<td>kaan + [mii] mii phiw -&gt; [VB.N kaan mii phiw]</td>
<td>‘Existing a strong storm’</td>
</tr>
</tbody>
</table>

(7c) and (7d) show nominalization of two homophonous verbs, mii. The former is a regular TV with the meaning of relationship or ownership. The nominalization of this mii ‘have (relationship/ownership)’ phrase is acceptable. The latter is an existential verb, and its nominalization is questionable.

To sum up, nominalization morpheme kaan grammatically precedes INTV and TV phrases. However, the process becomes questionable when this morpheme precedes the existential mii construction. Sentences in (8) show that Nom kaan does not allow S to follow it.

<table>
<thead>
<tr>
<th>Type</th>
<th>Nominalization</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td>INTV:</td>
<td></td>
</tr>
<tr>
<td>b.</td>
<td>TV:</td>
<td></td>
</tr>
</tbody>
</table>

(8c) shows that kaan preceding the mii construction is only mildly better.

### 2 Richard Oehrle suggests this point to me.
To produce grammatical strings for (8), either Comp kaanthǐ or Comp thi must precede sentences (8a), (8b) and the mii construction (8c) to yield S' as a result. This is shown in 3.2.2.

3.2.2 Complementization

In this subsection I illustrate the complementization of INTV and TV sentences as well as the existential mii construction, all of which function as subjects of nonlocative copula verb pen sentence. I show in (9) that the mii construction behaves in the same manner as a sentence does; that is, it allows Comps kaanthǐ and thi to precede it to become S'.

(9) a. INTV:  
\[
\text{Is} \ [S' \ kaanthǐ/thi \ [S \ phaayū \ phât \ rxη]\ pen \ rɪaŋ \ naāklua]  
\text{comp:that} \ \text{storm} \ \text{blow} \ \text{strong} \ \text{be[-Loc]} \ \text{matter} \ \text{scary}  
\]

'That a storm blows strongly is a scary matter (or is scary)'

b. TV:  
\[
\text{Is} \ \text{kaanthǐ/thi} \ \text{Is} \ \text{phaayū \ rxη \ thamlaai \ muūbāan} \ \text{pen} \ \text{rɪaŋ \ naāklua}]  
\text{comp:that} \ \text{storm} \ \text{strong} \ \text{destroy} \ \text{village} \ \text{be} \ \text{matter} \ \text{scary}  
\]

'That a strong storm destroyed a village is a scary matter (or is scary)'

c. mii `exist'  
\[
\text{Is} \ [S' \ kaanth /thh} \ \text{[mii \ phaayii \ rxη]} \ \text{pen} \ \text{rɪaŋ \ thammadaa]  
\text{comp:that} \ \text{exist} \ \text{storm} \ \text{strong} \ \text{be} \ \text{matter} \ \text{normal}  
\]

'That there is a strong storm is a normal matter (or is normal)'

(10a) and (10b) show that Comps kaanthǐ and thi cannot precede either intransitive VP or transitive VP.

(10) a. INTV:  
\[
*\text{Is} \ \text{kaanthǐ/thi} \ \text{Is} \ \text{phât \ rxη} \ \text{pen} \ \text{sĩŋ} \ \text{naāklua]  
\text{comp:that} \ \text{blow} \ \text{strong} \ \text{be} \ \text{thing} \ \text{scary}  
\]

b. TV:  
\[
*\text{Is} \ \text{kaanthǐ/thi} \ \text{Is} \ \text{thamlaai \ muūbāan} \ \text{pen} \ \text{rɪaŋ \ naāklua]  
\text{comp:that} \ \text{destroy} \ \text{village} \ \text{be} \ \text{matter} \ \text{scary}  
\]

The evidence above shows that the mii `exist' construction behaves like a sentence in that it does occur grammatically after Comps kaanthǐ and thi. From 3.2.1 and 3.2.2 it should be concluded (1) that Nom kaan takes only TV and INTV phrases to form verbal noun phrases. However, for kaan to take the mii `exist' construction is questionable, (2) that Comps kaanthǐ and thi take TV and INTV sentences as well as the mii `exist' construction, but not verb phrases, to form complementized sentences.

3.2.3 Imperativization

In this subsection I illustrate the imperative construction in Thai to show that an element or a unit immediately following the existential verb mii behaves like a subject of a sentence, which can be given an order or a command. In a vocative imperative, only a subject has a vocative possibility. When the subject is understood, it is omitted, leaving VP to occur as a nonvocative imperative.

An order or a command in Thai is normally given to the second person, both singular and plural. The second person here includes such trained or tamed animals as dogs, horses and monkeys etc. A number of Thais in the past generations as well as old people in the present generation have believed in magics and supernatural power; they expressed their beliefs in folklores,
literature work and poems. Some evidence of such beliefs are shown in the form of giving an order to nature in the form of a storm, the sky, the wind, the water including such nonhuman living things as bees, snakes, ants and etc. In this case the vocative imperative is used.

Imperatives in Thai are expressed in the following pattern.

(II) (Addressee given an order < PAUSE ) < (Imperative morpheme joŋ ) < VP < (Imperative morpheme nā )

From (II) we see that VP is obligatory in vocative and nonvocative imperatives. There are two optional imperative morphemes denoting emphasis: preverbal joŋ and postverbal nā. In a vocative imperative, an addressee given an order is obligatory, and it must be followed by a pause and a VP respectively. Failure to follow this pattern yields an unacceptable sentence. Examples of imperatives, both vocative and nonvocative, are shown below.

(12) a. INTV S:
    [s  dŋ yuŋ nai bān]
    Dang bē[+loc] in house
    ‘Dang is in the house’

b. IMP S: Nonvocative (Addressee Dang is understood )
    [VP yuu nai bān nā ]
    bē[+loc] in house imp
    ‘Be (stay) in the house!’

c. IMP S: Vocative
    [s  dŋ PAUSE [VP joŋ yuŋ nai bān nā ]]
    Dang PAUSE imp bē[+loc] in house imp
    ‘Dang, PAUSE stay home!’

In case a person who gives an order has power over the nature as mentioned earlier, nature will be the addressee given an order. The addressee in a TV vocative imperative must come from a subject, not an object, of a TV indicative. Sentence (12d) is imperativized as shown in (12e).

(12) d. TV S:
    [s  phaayū thamlaai mūbān nī thāwnān ]
    storm destroy village this only
    ‘The storm destroyed only this village’

e. IMP S: Vocative
    [s  phaayū PAUSE [VP joŋ thamlaai mūbān nī thāwnān nā ]]
    storm PAUSE imp destroy village this only imp
    ‘Storm, PAUSE destroy only this village!’
    */?? [s  phaayū joŋ thamlaai mūbān nī thāwnān nā ]

In vocative imperative (12e), NP phaayū ‘storm’, a subject of an indicative in (12d), acts as an addressee given an order. Without a pause after an addressee in a vocative imperative, the resulting string is not grammatical.

The nonvocative imperative of (12d) is shown in (12f).

(12) f. IMP S: Nonvocative (Addressee phaayū is understood)
[thamlaai muúbâan ní thâwnán ná]
destroy village this only imp
`Destroy only this village!`

(12g) shows that vocative NP muúbâan ní ‘this village’ and subject NP phaayú ‘storm’ cannot cooccur. Recall that only subject, not direct object, has a vocative possibility.

(12) g. *[thamlaai muúbâan ní PAUSE phaayú joq thamlaai ná] 
village this PAUSE storm imp destroy imp
`*This village, storm destroy!' 

Now compare a nonvocative imperative (12f) with the indicative mii construction in (12h) and its nonvocative imperative in (12i) respectively. Here we see that the behavior of the mii construction is different from that of the INTVP and TVP. While the latter can express the imperative meaning, the former cannot. (12h) shows that the mii construction is not an imperative. Hence it cannot yield the imperative meaning.

(12) h. mii ‘exist’ Construction: Indicative
[mii phaayú nai thaleesaai ní thâwnán] 
exist storm in desert this only
`There is a storm only in this desert' OR
`A storm exists only in this desert'

** Storm, exist in this desert only!"

(12i) shows that the mii construction, despite appearing in a VP form, cannot occur as a nonvocative imperative.

(12) i. IMP S: Nonvocative
[*mii phaayú nai thaleesaai ní thâwnán ná] 
exist storm in desert this only imp
`Exist a storm only in this desert!'

The evidence shows that the mii construction acts like a sentence rather than a VP. Based on the analysis in 3.2, I propose that the existential mii construction is a sentence, not a VP. According to this proposal, we can take one of the two positions: (1) NP, S and S' which occur right after verb mii ‘exist’ are objects of this verb since they occur in the object position, in which all direct objects of TV occur. Hence verb mii is a TV, and there is no subject in the TV mii sentence. (2) NP, S and S' are postverbal subjects of the verb mii; hence this verb is an INTV. The second position supports the idea that a sentence must have a subject, and it also forces us to accept two types of subject: preverbal and postverbal. The argument that NP, S and S' which occur after the verb mii is a subject, not the object, of this verb is given in the following section.

3.3 Subjecthood of Element After Existential Verb mii

To argue that an element in the position after the verb mii is the subject, not the object, of this verb, I provide three tests: passivization in 3.3.1; imperativization in 3.3.2; and topicalization of VP in 3.3.3 respectively.

3.3.1 Passivization

In Thai only a transitive sentence, not an intransitive one, can undergo passivization. The
passive construction in this language is shown in (13).

(13) Given a simple transitive \([NP_1 \ TV \ NP_2 \ X]\), the corresponding passive is:
\([NP_2 \ Passive\ morpheme \ thúuk/ \ dOOn \ (NP_1) \ TV \ X]\).

(14) illustrates passivization of the TV, INTV and the mii sentences.

(14) a. TV:
\[
\text{Is phaayú thamlaai [NP muubáan níi]} \\
\text{storm destroy village this}
\]
`A storm destroyed this village'

b. Passivization
\[
\text{Is [NP muubáan níi] thúuk phaayú thamlaai} \\
village this pass storm destroy
\]
`This village was destroyed by a storm'

(14c) is ruled out because it does not respect the passive construction in (13); phaayú `storm', as NP1, cannot occur right before the passive morpheme thúuk.

(14) c. *\[Is [NP phaayú] thúuk thamlaai [NP muubáan níi]]
storm pass destroy village this

(15) shows that an INTV sentence cannot be passivized.

(15) a. INTV:
\[
\text{Is cán náŋ thíníñi} \\
\text{I sit here}
\]
`I sit here'

b. *Passivization
\[
\text{*[Is [NP cán] thúuk náŋ thíníñi]} \\
\text{I pass sit here}
\]

Similar to INTV sentence (15), the mii sentence cannot be passivized either, as shown in (16).

(16) a. mii `exist':
\[
\text{Is mii [NP phaayú] thíníñi} \\
\text{exist storm here}
\]
`There is a storm here'

b. *Passivization
\[
\text{*[Is [NP phaayú] thúuk mii thíníñi]} \\
\text{storm pass exist here}
\]

The evidence shows that the mii sentence acts like an intransitive sentence, not a transitive one. Like NP subject cán `I' in (15), NP phaayú `storm' in the object position of the verb mii in (16) can never occur right before passive morpheme thúuk. Thus we see that an element in the object position of the verb mii behaves exactly like subjects of INTVs and TVs, but not like objects of TV.
3.3.2 Imperativization

In addition to the use of the imperative structure which argues that the mii construction is a sentence, not a VP, I continue to use the same structure to show that the elements, especially NP, which occur postverbally are subjects, not objects, of this existential verb. (17b) shows the vocative property of an element following verb mii. In a vocative imperative, NP phaayú 'storm' occurs sentence initially followed by a pause. But in a nonvocative imperative, this NP, as an understood addressee, does not occur in the sentence, as shown in (17c).

(17) a. mii S:
\[s \text{ mii phaayú nai thaleesaai mī thāwnān]}
\[\text{exist storm in desert this only}
\`A storm exists only in this desert'

b. IMP S: Vocative
\[s [NP phaayú] \text{ PAUSE mii nai thaleesaai mī thāwnān nā]}
\`Storm, PAUSE exist only in this desert!'

c. IMP S: Nonvocative (Addressee phaayú is understood)
\[[vP mii nai thaleesaai nī thāwnān nā]}
\[\text{exist in desert this only imp}
\`Exist only in this desert!'

Since only subject has the vocative property as stated before, (17b) and (17c) clearly show that an NP following the verb mii is a subject, not a direct object, of this verb.

3.3.3 Topicalization of VP

In this subsection I illustrate topicalization of the VP constituent in Thai to argue for the subjecthood of an element following the existential verb mii. In Thai when both VP and its subject are emphasized, VP can be topicalized, yielding the VP-subject construction. However, this process is optional; that is, a sentence with the emphasized Subject and emphasized VP can remain in the subject-VP construction. The emphasized subject appears either as a subject followed by an emphasis morpheme nā or as a subject followed by definite words. To say that VP is emphasized means that either a VP is modified by an adverb of intensification, or an adverb under VP is modified by a degree, or a quantifier is modified by a degree. The VP Topicalization rule is shown as follows.

(18) VP Topicalization

Given \([\text{Subject}[+\text{Emp}], \text{VP}[+\text{Emp}]]\), the corresponding VP Topicalization is: \([\text{VP}[+\text{Emp}] < \text{Subject}[+\text{Emp}]]\).

(18) states that the emphasized VP precedes the emphasized subject.

(19a) shows a sentence with nonemphasis of subject and VP, and (19b) a sentence with the emphasis of subject and VP.

(19) a. Is [NP nākriān] [VP tham kaanbāān yāngdiii]
\[\text{student do homework well}
\`A student does homework well'
b. \[ s | [NP \text{nákrian} \text{khon nii} | \text{VP} \text{tham} \text{kaanbán} \text{yaándii} \text{thiidiaw}] \]
   `This student does homework quite well'

VP in (19b) can be topicalized as (19c).

(19) c. VP Topicalization
   \[ s | [\text{VP} \text{tham} \text{kaanbán} \text{yaándii} \text{thiidiaw} | \text{NP} \text{nákrian} \text{khon nii}] \]
   `Does homework quite well, this student'

(19b) can be VP-topicalized as (19c) because (1) NP subject nákrian `student' is emphasized or modified by the definite morphemes khon + nii `noun classifier + this', and (2) adverb yaándii `well' in VP is modified by the degree word thiidiaw `quite'. Thus the whole VP can be topicalized, yielding the VP-subject construction. VP in (19a) cannot be topicalized, as shown in (19d), because the subject nákrian `student' is not emphasized; nor is the VP or the adverb yaándii `well' in the VP.

(19) d. Ill-formed Topicalization
   \[ *s | [\text{VP} \text{tham} \text{yaán díi} | \text{NP} \text{nákrian}] \]

Notice that a transitive VP cannot be topicalized without its object. Compare (19c) with (19e) and (19f) below.

(19) e. *\[ s | [\text{VP} \text{tham} \text{yaándii} \text{thiidiaw} | \text{NP} \text{nákrian} \text{khon nii}] \]

f. *\[ s | [\text{VP} \text{tham} \text{yaándii} \text{thiidiaw} | \text{NP} \text{kaanbán} \text{khon nii}] \]

Topicalization of tham VP fails in (19e) and (19f) because its object kaanbán `homework' does not follow as part of the VP in the former, and this NP object does not occur in the correct position (that is, right after TV tham `do') in the latter. This phenomenon argues for the existence of a VP constituent in Thai. (20) shows a topicalization of verb mii. The mii VP in (20a) can be topicalized, having NP phaayú rxq bxxp níi `this kind of strong storm' follow it as shown in (20b).

(20) a. mii Sentence
   \[ s | [\text{VP} \text{mii} | \text{NP} \text{phaayú} \text{rxq} \text{bxxp níi}] | \text{PP} \text{pp} \text{nai} \text{thaleesaal}] \]
   `There is this kind of strong storm only in a desert'

b. Topicalization
   \[ s | [\text{VP} \text{mii} | \text{PP} \text{nai} \text{thaleesaal}] | \text{ADVP} \text{thâwnán}] \]
   `Exists only in a desert, this kind of strong storm'

Topicalization of this existential verb works here because (1) NP phaayú rxq `strong storm' is modified by definite phrase bxxp níi `this kind', and (2) PP nai thaleesaal `in a desert' is
emphasized or modified by AdvP thâwñan 'only'. From 3.3 we see that an element following the verb mii does act, again, exactly in the same manner as a subject does. That is, it follows the whole VP which is topicalized, forming the VP-subject construction. From the analysis in Section 3 we can conclude that an element in the position after the existential verb mii is a postverbal subject, and thus there exists the VS structure in Thai.

To describe the subject-verb (SV) and verb-subject (VS) structures in Thai, I use HPSG theory (Pollard & Sag 1987). To follow my application of this theory to such structures, which is demonstrated in Section 4, the reader is referred to Information-Based Syntax and Semantics: Volume 1 Fundamentals (Pollard & Sag 1987). For a convenience of reading, I provide necessary terms used in this framework in the Appendix.

4.0 Application of HPSG Theory to the SV and VS Structure in Thai

I divide this section into two subsections: 4.1 HPSG Subcategorization and Preverbal and Postverbal Subjects in Thai; and 4.2 Alternatives for Describing the VS(Complement) Structure.

4.1 HPSG Subcategorization and Preverbal and Postverbal Subjects in Thai

In HPSG theory, the feature SUBCAT(EGORIZATION) is used to encode the dependencies that hold between a lexical head and its complements (the signs that it characteristically combines with). SUBCAT takes a list of (partially specified) signs as its value. The position of an element on the list corresponds to the obliqueness of the complement sign which it describes. The rightmost element corresponds to the least oblique depending on sign or subject. HPSG treats subject as subcategorized-for. As a head combines syntactically with a complement, grammatical information associated with the complement is unified with the partial information specified in the appropriate position on the head's SUBCAT list, as required by the Subcategorization Principle shown in (21).

\[(21) \text{Subcategorization Principle} \]

\[
\begin{align*}
\text{DTRS} & \quad \text{headed-structure[1]} \quad \Rightarrow \\
\text{SYN|LOC|SUBCAT} & \quad [2] \\
\text{DTRS} & \quad \left[ \text{HEAD-DTR|SYN|LOC|SUBCAT append ([1],[2])} \right] \\
\text{COMP-DTRS} & \quad [1]
\end{align*}
\]

According to (21), in any headed structure, the SUBCAT value is obtained by removing from the SUBCAT value of the head those specifications that were satisfied by one of the complement daughters. The structure sharing (indicated by the double occurrences of the tags '[1]' and '[2]') entails that the information from each complement daughter is actually unified with the corresponding subcategorization specification on the head. Thus a sign can satisfy a subcategorization specification on some head only if it is consistent with that specification. For example: (Here 'SUBCAT' abbreviates 'SYN|LOC|SUBCAT'.)
(21) shows that the lexical Head 'like' combines first with the leftmost Complement in the Subcat list, which is NP 'him', forming VP Head 'like him'. Next, this VP Head combines with the rightmost Complement in the Subcat list, NP 'I', forming a sentence 'I like him'. According to this theory, Complement 'I' on the rightmost Subcat list, which is the least oblique, is a subject of the sentence.

HPSG theory works nicely on the subject-verb (SV) and the verb-subject (VS) structures in Thai, as shown in (27). However, a problem arises when it applies to the verb-subject-complement (VSC) structure in this language.

Certain verbs in Thai require one adverb of frequency or adverb of time or adverb/preposition of place as their Complement. Hence this adverb/preposition is obligatory under the VP node. For instance, copula verb of location yuù and INTV of location aasáiyuù 'live', which require a preverbal subject, require adverbs of place. The INTV of occurrence, kEEtkhín, which requires a preverbal subject, and the INTV of occurrence kEE, which requires a postverbal subject, both require either adverb of frequency or adverb/preposition of place as their Complement. As an example, (22) shows that adverb of frequency iIk 'again' is obligatory for verb of occurrence kEE.

(22) a. lS kEEt phaayu [ADVP iIk] occur storm again
   'A storm occurs again'
b. *lS [ADVP iIk] kEEt phaayu
   c. ?? lS kEEt phaayu

3 Verbs of location such as copula yuù and INTV aasáiyuù 'live' requires ADV of place of PP of place as their complement. For example:

(i) lS dxη aasáiyuù [PP.P nai thaleesaai]/[ADVP.P thini]i
   Dang live in desert here
   'Dang lives in a desert' or 'Dang lives here'

(ii) *lS dxη aasáiyuù
   Danglive

(iii) *lS dxη aasáiyuù [ADVP.F bOyôyôy]/[ADVP.T mlawanníi]
   Dang live often yesterday

(ii) is ruled out because INTV aasáiyuù 'live' requires PP or ADVP of place as its complement. (iii) is ruled out because the complement of this verb is AdvP of frequency or ADVP of time, not that of place.
When applying HPSG to this sentence, we will have only the following strings, (23a) and (23b), which are ungrammatical.

(23) a. *[s
b. *is [vp

(23a) is ruled out because verb of occurrence kEEt requires a postverbal subject, not a preverbal one. (23b) is ruled out because Verb-Complement-Subject is not a grammatical sentence structure. The only structure that we want is VSC, as shown in (23c).

(23) c. [kEEt phaayû iik]
occurs storm again

'A storm occurs again'

There are several ways to describe the SV(C) and VS(C) structures in Thai. In this paper I present two alternatives for describing the VSC structure: the use of Wrapping operation and an extension of Adjunct.

4.2 Alternatives for Describing the VSC Structure

I divide this subsection into two: 4.2.1: Alternative 1: The Wrapping Operation, and 4.2.2: Alternative 2: An Extension of Adjunct. I discuss advantages and disadvantages of each. The major difference between these two alternatives is that while Alternative 1 treats the required adverb/preposition phrases as Complements of certain verbs, Alternative 2 treats them as obligatory Adjuncts. In my analysis, [INV(ERTED)+] is a crucial feature-value in describing the SV and VS structures in Thai. A verb in the VS structure is described as having the feature-value [INV+], while that in the SV structure as having the feature-value [INV-]. In addition, the feature-value [LEX+] is for a lexical item, and [LEX-] for a phrase.

4.2.1 Alternative 1: Wrapping

This alternative treats obligatory ADVPs or obligatory PPs as Complements, but the optional ones as Adjuncts. It describes the SV and VS structures as follows.

4.2.1.1 The SV Structure

The SV structure is described by the following grammar rules and linear precedence principles.

(24) Grammar Rules

Rule 1: [SUBCAT < >] -> HEAD [LEX-, INV-], COMPLEMENT
This rule requires that a noninverted phrasal Head combine with a subject Complement.

Rule 2: [SUBCAT <[]>] -> HEAD [LEX-, INV-], COMPLEMENT*
This rule requires that a noninverted lexical Head combine with its Complement(s).

4 Susan Steele suggests this possibility to me.
Linear Precedence Principles

LP 1: COMPLEMENT [MAJ N v V] < HEAD [LEX-, INV-]
LP 1 requires that a NP subject Complement or a sentential subject Complement (S or S') precede a noninverted VP Head.

LP 2: COMPLEMENT [MAJ:-V] << [LEX-]
LP 2 requires that, except for VP and S Complements, a NP or AP or PP Complement precede a more oblique sister phrase, whether they are Complement or Adjunct, and that a Complement precede an Adjunct.5

LP 3: HEAD [LEX+] < []
This LP requires that a lexical Head precede its phrasal Complement. (25) shows the combination of a Head and its Complement(s). In (25), an noninverted lexical verb Head keetkhÌn 'occur' first combines with its AdvP Complement ilk 'again' by GR 2, and in association with LP 3 forming string keetkhÌn ilk. Next this phrasal V Head combines with NP phaavù 'storm', its rightmost Complement in the Subcat list, and in association with LP 1 yielding a sentence phaavù keetkhì ilk.

5 LP 2 takes care of the following structures:

First (COMPLEMENT [less oblique] < COMPLEMENT [more oblique]), the following shows that khàw 'he' is less oblique Complement than S' Complement wàa cán ja pail 'that I will go'.

(i) a. [s cán sányaa [C kháw] [Cs' wàa cán ja pail]]
   I promise he that I will go
   'I promise him that I will go'
   b. *[s cán sányaa [Cs' wàa cán ja pail] [C kháw]]

Second (COMPLEMENT < ADJUNCT), the following shows that C kháw 'he' must precede Adjunct mìawaanni 'yesterday', but not vice versa.

(ii) a. [s cán phóp [C kháw] [ADJ mìawaanni]]
    I meet him yesterday
    'I met him yesterday'
   b. *[s cán phóp [ADJ mìawaanni] [C kháw]]

Third (COMPLEMENT [MAJ:V] < ADJUNCT or ADJUNCT < COMPLEMENT), (iiia) shows that C [MA V] precedes Adjunct while (iiib) Adjunct precedes C [MA: V].

(iii) a. [s cán töothìaŋ [Cs' wàa cán mài phìt] [ADJ yaãnrunxŋ]]
    I argue that I not wrong strongly
    'I argued that I was not wrong strongly'
   b. *[s cán töothìaŋ [ADJ yaãnrunxŋ] [Cs' wàa cán mài phìt]]
      I argue strongly that I not wrong
      'I argued strongly that I was not wrong'
4.2.1.2 The VS Structure

The VS structure can be described by the following rules.

(26) Grammar Rule

Rule 3: [SUBCAT < ] -> HEAD [LEX-, INV +], COMPLEMENT

This rule requires that an inverted VP Head combine with its subject Complement.

Linear Precedence Principle

LP 4: HEAD [LEX-, INV+] < COMPLEMENT [MAJ N V, FOCUS -]

This LP requires that an inverted VP Head precede its subject Complement which is either NP or S or S' and nonfocused. For example:

(27) shows that an inverted lexical V Head mii first becomes a nonlexical V Head. By means of GR 3, this inverted nonlexical V Head combines with phaayú 'storm', its only NP Complement in the Subcat list, and in association with LP 4 forming the string mii phaayú, which is a grammatical
4.2.1.3 Problem

Even though Rule 3 and LP 4 work nicely with verb of existence mii as shown in (27), they cannot apply to verb of occurrence kEEt because this verb requires an Adv of frequency or Adv/P of place or Adv of time as discussed in Section 4.1. If the [LEX-, INV+] Head (or the VP Head) is inverted, and if this obligatory adverb/preposition is a Complement, we will have the nonfocused VP Head precede its subject complement, which yields an ungrammatical string as shown in (23b).

4.2.1.4 Solution

To describe the VSC structure of INTV kEEt `occur', I assign a special feature (let's say the feature 'a') to the inverted Head. This feature serves to mark the first element of the [LEX-, INV+] Head only. In so doing, it is only the first element of this peculiar Head that undergoes the inversion, leaving behind the following element(s) in the same string. The use of the feature 'a' is illustrated as follows.

(28) HEAD@ [LEX-, INV+]: HEAD ELEMENT 1@ [INV+] < HEAD ELEMENT 2 [INV-] ... < HEAD ELEMENT n [INV-]

Using the feature 'a', we revise Grammar Rule 3 and LP 4 as Grammar Rule 4 and LP 5 respectively.

(29) Grammar Rule

Rule 4: [SUBCAT < >] -> HEAD@ [LEX-, INV+], COMPLEMENT

This rule requires that an inverted VP Head combine with its subject Complement.

Linear Precedence Principle

LP 5: HEAD ELEMENT 1@ [LEX-, INV+] < COMPLEMENT [MAJ N v V, FOCUS-] < HEAD ELEMENT 2 [LEX-, INV-] ... HEAD ELEMENT n [LEX-, INV-]

LP5, or the revised LP 4, requires that the first element of the VP Head precede its subject Complement, and that the subject Complement precede the rest (element(s)) of this VP.

Using Rule 4 and LP 5, the VSC(omplement) structure is described as follows:

(30) V[SC< >] kEEt phaayu bOybOy

58
Resulting sentence: \[k\text{EE}t \_NP \text{phaay}u \_ADVP b\text{OybOy}]\]

`A storm often occurs'

Sentence (30) is formed as follows. First by GR 2 an inverted lexical V Head k\text{EE}t 'occur' combines with its ADVP Complement b\text{OybOy} 'often', forming a phrasal V Head k\text{EE}t b\text{OybOy} 'occurs often' by LP 3. Next with the help of GR 4 and LP 5, only the first element of the inverted phrasal V Head, that is k\text{EE}t, precedes NP phaayu 'storm', the rightmost Complement in its Subcat list, leaving behind (or after NP phaayu) the second element of the phrasal V Head, or b\text{OybOy} 'often'. The result is thus a Verb-Subject-Complementsentence. The sentence [k\text{EE}t phaayu b\text{OybOy}] is formally illustrated in (31) below.

(31)

From the illustration above we see that with the help of the feature '@', we do not need to build up more grammar rules or linear precedence principles for constructing the VSC structure of INTV k\text{EE}t 'occur', which requires either Adv of frequency or Adv of time or Adv/P of place as its Complement. We only add this feature on the inverted VP Head in Grammar Rule 4 as HEAD @ [LEX-,INV+], and on the first element of the VP Head as HEAD ELEMENT 1 @ [LEX-,INV+] in LP
5. Next the feature ‘@’ can also apply to another inverted VP, the (lexical) verb which does not subcategorize for any Adv or P Complement, without affecting the resulting string. The reason is that only the first element of the [LEX-] Head can be inverted in Thai. It is observed that the cooperation of the feature ‘@’ and the feature-value [INV+] is similar to the Right-Left Head Wrapping of Head Grammar (Pollard 1985). Due to the characteristics of the verb of occurrence kèt, e.g. that (i) it requires an Adv/P Complement as shown in 4.1, and particularly (ii) that it must be inverted or occur in the VS structure, HPSG theory cannot avoid, in this alternative only, the kind of ‘Wrapping’ process when applied to Thai. It is concluded that taking this alternative, we need to modify the inverted VP Head.

4.2.2 Alternative 2: An Extension of Adjunct

Another alternative to describe the SV and VS structure in Thai treats elements required by INTVs of occurrence and location as Adjuncts. I divide this subsection into four parts: 4.2.2.1: Adjuncts in Thai; 4.2.2.2: The Syntax of Adjuncts (Pollard & Sag 1987); 4.2.2.3 Descriptions of the SV and VS structures in Thai; and 4.2.2.4: Discussion.

4.2.2.1. Adjuncts in Thai

Adjuncts in Thai are similar to those in English. Relative clauses are adjuncts licensed by NP, S and S’ Complements. Adjective modifiers are adjuncts licensed by NP Complements. Adverbial modifiers as well as PP [+Loc] are those released by a lexical Verb Head. To treat an obligatory AdvP or PP accompanying verbs of occurrence and verbs of location, I propose two types of adjuncts in Thai: (1) obligatory adjuncts which are licensed by verbs of occurrence and location; (2) non-obligatory adjuncts which are licensed by the rest. To distinguish the former from the latter, I modify HPSG notation, capitalizing and underlying the obligatory adjuncts.6

4.2.2.2 The Syntax of Adjunct

According to HPSG theory, adjunct selection is syntactically different from complement selection in at least two respects. First, the number of signs that allow a category of adjuncts (e.g. relative clauses, adjectives, manner adverbials, etc.) to modify them is bigger than the number of

6 The non-obligatory adjuncts for other verbs (i.e. not verbs of occurrence and location) are shown as follows. (i) shows that TV dīlm ‘drink’ does not subcategorize for an adjunct. It can be either present or absent in this sentence. An non-obligatory adjunct is parenthesized.

(i) I s cān kamlāq dīlm kāafx (lADJ nai bān)[]  
I Prog drink coffee in house
‘I am drinking coffee (in the house)’

(iia) and (iib) show the occurrence of the non-obligatory adjunct of frequency bōybōy ‘often’ of TV hēn ‘see’.

(ii) a. I s cān hēn l s joon tīi tāmruāt l (lADJ bōybōy)[]  
I see robber hit policeman often
‘I see [a robber hits a policeman] (often)’

b. I s cān hēn (lADJ bōybōy) l s thī joon tīi tāmruāt[]  
I see often that robber hit policeman
‘I see (often) [a robber hits a policeman]’
signs that select or require a category of complements. For instance, a relative clause, as an adjunct, can modify any common noun, and a locative adjunct can modify any verb; however, only certain nouns (e.g. reliance) subcategorize for a PP [ON] Complement and only certain verbs (e.g. modal auxiliaries) subcategorize for a VP [BSE] xcomp.

Secondly, while a complement daughter discharges, or cancels, the subcategorization requirement that it matches, an adjunct does not. For a given head there can be at most one PP[ON] Complement or at most one VP[BSE] xcomp, but there can be arbitrarily many relative clauses or locative adjuncts. In other words, Adjuncts of the same kind can iterate; e.g., two or more relative clauses or two or more locative adjuncts may modify the same head. In this theory, Adjuncts is treated as a head feature. That is, if we posit a set-of-categories-valued feature Adjuncts, whose value specifies the categories of adjuncts that can modify projections of a given lexical head, that value will be passed up to phrasal projections of that head. Adjuncts are licensed by either a head or by an NP Complement; that is, a head or an NP Complement allows Adjuncts to modify it, and this modification is optional. When an adjunct is associated with an object complement, it is necessarily contained within the VP. However, when it is associated with a subject complement, it must be outside the VP, i.e. a daughter of S. This is so because Adjuncts is a head feature, and is therefore specified on the maximal phrase the licensing word projects (by the Head Feature Principle), but on no superordinate phrase. Hence the Adjuncts Principle (shown below) ensures that an NP complement can license an Adjunct only if it is a sister to it.

Adjunct Principle:

\[
\text{constituent \text{-} structure} \xrightarrow{=} \text{HEAD\text{-}DTR}\text{SYN}\text{-}LOC\text{-}HEAD\text{-}ADJUNCTS [1]}
\text{COMP\text{-}DTRS [3]}
\text{ADJ\text{-}DTRS [2]}
\]

CONDITION: $\forall X \in [2] \exists Y \in [1]$ such that $\text{SYNTAX} (X) = Y$ or $\exists Z \in [3] Y \in \text{SYN}\text{-}LOC\text{-}HEAD\text{-}ADJUNCTS (Z)$ such that $\text{SYNTAX} (X) = Y$ and $\text{SYN}\text{-}LOC\text{-}HEAD\text{-}MAJ (Z) = N$

According to HPSG, adjuncts are more oblique than complements. Thus the Linear Precedence Constraint which requires that complements precede more oblique complements, can be generalized to require that complements precede adjuncts. Since VP and S complements are not affected by this requirement, HPSG excludes them from the domain of application of the generalization of LP 2 as shown below.

LP 2: COMPLEMENT [MAJ:-V] << [LEX-]

formulation guarantees that NP, PP and AP complements are ordered before oblique sister phrases, whether these are complements or adjuncts. It does not require VP or S complements to before more oblique sisters.

4.2.2.3 Description of SV and VS Structure

4.2.2.3.1 The SV Structure

The SV structure can be described by Grammar Rules 1, 2, the Adjunct Principle (in (32)), and 3. This structure is formally illustrated in (33).
He lives in a desert.' which is marked by tag \([3]\), is licensed by the noninverted INTV Head \(aas\dot{a}yu\) 'live'.

4.2.2.3.2 The VSC Structure

The VS structure can be described by Grammar Rule 3, the Adjunct Principle (in (32)), and LPs 2 and 4. The following example shows how a PP Complement is treated as an obligatory adjunct of the inverted verb of occurrence \(k\ddot{e}t\). Note that only one Adjunct is obligatory for verbs of occurrence and verbs of location.
4.2.2.4 It is found that an extension of HPSG theory by treating obligatory AdvPs and PPs as obligatory Adjuncts in describing the SV(C) and VS(C) structures in Thai is advantageous in that: first, since there is no VSO(object) structure in Thai, this modification avoids the V Head Wrapping, hence the capture of the SV(C) and VS(C) structures is simpler. Second, Alternative 2 does not affect any part of the grammar rules in Thai as far as we accept a difference in properties between Complement and Adjunct, and accept that there are two types of Adjuncts in Thai: the obligatory, licensed by the Heads of verbs of occurrence and location, and the non-obligatory, licensed by the rest. Taking this alternative, however, we need to modify the Adjunct rule in HPSG framework to allow both types of adjuncts.

5. Conclusion

I have demonstrated in this paper two major analyses. The first analysis is on positions of subjects in Thai sentences. I propose that there are two types of subjects in Thai: preverbal and postverbal. The latter type is required by such verbs as mii ‘exist’ and kEEt ‘occur’. I call...
'noninverted verbs' those which require preverbal subjects and 'inverted verbs' those requiring postverbal subjects. This way of analysis, to my knowledge, has not been done before. What I claim here as the Verb-Subject structure in Thai has been analyzed by some linguists or grammarians as a Subject-Verb structure with a deletion of subject. Their reason is that both subject and object in Thai are usually omitted in conversation or in contextual sentences. Using such tests as nominalization, complementization, and imperativization to the mii 'exist' construction, I argue that this construction is a sentence; further, passivization, imperativization, and topicalization of VP are used to test that an element following this existential verb is in fact a postverbal subject, and hence there exists the VS structure in Thai.

My second analysis is on a theoretical description of the SV and VS structures in Thai, using HPSG theory. I use noninverted verbs kEEtkhln 'occur' and aasáiyúu 'live' as examples of the SV structure. As for the VS structure, I use inverted verbs mii 'exist' and kEEt 'occur'. To solve a problem with the VSC structure of inverted verb kEEt 'occur', I present two modifications of this framework. In Alternative 1, or Wrapping, ADVP or PP required by verbs are treated as Complements. In Alternative 2, or Extension of Adjunct, such elements are treated as obligatory Adjuncts. The analysis shows that Alternative 2 works better than Alternative 1 in that it avoids the use of the feature '@' as an additional mechanism in describing the VSC structure in Thai.

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Appendix

In this section I present a brief background of Head-Driven Phrase Structure Grammar (HPSG) and definitions or descriptions of necessary terms used in this theory.

1. Background

HPSG is the extension of the Generalized Phrase Structure Grammar (GPSG) theory by Gazdar, Klein, Pullum and Sag (1985). The HPSG treatment of syntactic features and categories borrows freely from the work in GPSG. Two of the proposed principles of universal grammar, the Head Feature Principle and the Binding Inheritance Principle are reformulations of GPSG's Head Feature Convention and Foot Feature Principle respectively. A third principle of universal grammar posited by HPSG is the Subcategorization Principle; this principle is a generalization of the argument cancellation employed in categorial grammar. The semantic part is based on the situation semantics by Fenstad et al. (1985).

In HPSG the syntactic and semantic aspects of grammatical theory are built up in an integrated way from the start, under the assumption that neither can be well understood in isolation from the other.

2. Definitions/Description of Some Terms

Partial Information and Feature Structures

Intuitively, a feature structure is just an information-bearing object that describes or represents another thing by specifying values for various attributes of the described thing; we think of the feature structure as providing partial information about the thing described. In HPSG, we think of feature structures as partial descriptions of signs and other linguistic objects which occur as parts of sign. For example, the lexical sign cookie sign is partially described by the feature structure:

```
1) PHON [cookie]
   SEM [COOKIE]
   SYN [MAJ(OR) N(OUN)]
   AGR(EMENT) 3S(INGULAR)]
```

Thus we have PHONOLOGY, SEMANTICS AND SYNTAX as the feature structure of sign.

```
2) PHONOLOGY
   SEMANTICS
   SYNTAX
```

Sign: There are two types of sign: lexical and phrasal. Lexical sign has the feature-value [LEX+] while phrasal the [LEX-].

Lexical sign: There are two types of lexical sign: major and minor. Major lexical sign consists of Head and Subcategorization (SUBCAT). What can be Head are noun, adjective, verb and preposition. There are two types of SUBCAT: saturated with the feature-value [SUBCAT ->] and unsaturated with [SUBCAT <->]; this means that, the former does not require for any element while the latter does. That is why it has a square bracket as its value. Minor lexical sign consists of determiner and conjunction.
Phrasal sign: According to HPSG, the Head Feature principle says: if sign X is phrasal and Y is the head daughter of X, then X and Y share the same value for the path SYNTAX|LOCAL|HEAD. Syntactic categories (which is the value of feature SYNTAX) are analyzed as having the two attributes LOCAL and BINDING, while LOCAL values in turn have the attributes HEAD, LEX and SUBCAT.

Local feature: specifies inherent syntactic properties of a sign, such as part of speech, inflection, case, subcategorization and lexicality (whether a sign is lexical or phrasal). The three main local syntactic features are:

1. Head features: specify syntactic properties that a lexical sign shares with its projections (i.e. the phrasal signs headed by that lexical sign).
2. SUBCAT feature: gives information about the valence of sign, i.e., the number and kind of phrase signs that the sign in question subcategorizes for or characteristically combines with.
3. The binary feature LEX: is used to distinguished between lexical and non-lexical signs.

DAUGHTERS: is attribute which the feature structures of type ‘phrasal-sign’ bear. This attribute provides the kind of information about constituency (but not about relative order of constituents) that is contained in conventional constituent-structure tree diagrams. The various daughters of a sign are distinguished according to what kinds of information they contribute to the sign as a whole.

Head-daughters (HEAD-DTRS): share their head features with the mother.

Complement daughters (COMP-DTRS): discharge subcategorization requirements on the head.

The Subcategorization: The subcategorization of a lexical or phrasal sign is a specification of the number and kind of other signs that the sign in question characteristically combines with in order to become complete. For example: intransitive verb ‘sneeze’ subcategorizes for only one NP (the subject) to make a complete sentence, and transitive verb ‘touch’ for two NPs (the object and the subject).

Adjuncts: are optional constituents or modifiers whose relationship to the Head is of a different syntactic and semantic nature. Optional elements regarded as adjuncts in English are subordinate clauses (e.g. because-clause), predicative (small clause), controlled adjuncts (e.g. Dead drunk, Kim ate the fish raw.), adjuncts of purpose, adjuncts of rationale, manner adverbials, frequentatives, duratives, full relatives, complementizerless relatives, reduced relatives, infinitival relatives and prenominal adjectives. Adjuncts in HPSG theory are licensed by the Head.