Directional Serial Verb Constructions in Thai

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Abstract

Directional Serial Verb Constructions (Directional SVCs), which are a subset of Serial Verb Constructions (SVCs) in Thai and involve motion-related verbs, are studied in this paper. According to two syntactic tests, two phrase structural schemata are involved in Thai Directional SVCs, including a recursive VP-over-VP structure and a complementation structure. Thai Directional SVCs also exhibit a dissociation between constituent structure and linear order. With this distinctive syntactic structure, Thai Directional SVCs are not reduceable to previously described SVCs. Nevertheless, within Head-Driven Phrase Structure Grammar, the rich featural specifications of heads and the mechanisms available for the percolation of specific head properties in a default interpretation of the Head Feature Principle allow for a straightforward model of Thai Directional SVCs.

1. **Introduction**

Serial Verb Constructions (SVCs) are interesting cross-linguistically because they consist of two or more verbal heads which are not related to each other through a predicate-argument relation, but which still occur in what is considered a single clause. In this paper, I discuss Thai Directional SVCs (or Motion-related SVCs), exemplified in (1):

(1) Malee wîŋ troŋ   jɔ́ɔn   khâam saphaan   Ɂɔ̀ɔk paj
     Malee run go straight reverse   cross bridge   exit go
     Malee ran straight back, crossing the bridge, out away from the speaker.

The sentence in (1) consists of six verb complexes[1], which share a common subject: *Malee*.

Directional SVCs in Thai have three aspects that are distinct from those found in other languages. First, the number of verb complexes that can occur in a Thai Directional SVC is far more than two, which is a common number of verb complexes for Directional SVCs in many other

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[1] Verb complexes are verbs or verbs plus their complements that can occur in SVCs (cf.(1) *khâam saphaan* 'cross bridge'). In this paper, I use the terms 'verb complex' and 'VP' interchangeably.

languages. Second, two phrase structure schemata are involved in Thai Directional SVCs, including a recursive structure VP → VP VP and a complementation structure for deictic verbs. Finally, Thai Directional SVCs exhibit a dissociation between constituent structure and linear order.

In this paper, I show that the hierarchical organization of phrase-structural schemata in a multiple inheritance hierarchy of types (Sag, 1997) and the rich system of lexical features available in Head-Driven Phrase Structure Grammar allow for a straightforward model of Thai Directional SVCs.

2. **Previous analyses of Directional SVCs**

Previous analyses of SVCs which are related to motion events in other languages assume that the sequence of verbs in these SVCs (i) have a head-complement relationship to each other (cf. Sebba, 1987; Winford, 1990), or (ii) belong to a multi-headed structure (Baker, 1989). In two studies of Directional SVCs in Sranan in the framework of Generalized Phrase Structure Grammar, Sebba (1987) and Winford (1990) suggest Immediate Dominance (ID) rules for the VP structure in which the initial verb (which denotes a manner of motion) subcategorizes for the serial verb (which indicates a directed motion). Some examples are:

(2) Jan   waak go   a   skuul
     John   walked go   to   school
     John walked thither to school. (Winford, 1990:125)

(3) dowwatra   ben   e   dropu fadon na   den   wiwiri
     dew-water PAST ASP   drop fall LOC   the-PL. leaf
     Dew was dripping on the leaves' (Sebba, 1987:44).

The above examples are accounted for by Sebba's ID rules (4)- (5) and Winford's ID rules (6)- (7) which are modified from Sebba's rules.

Sebba's ID rules
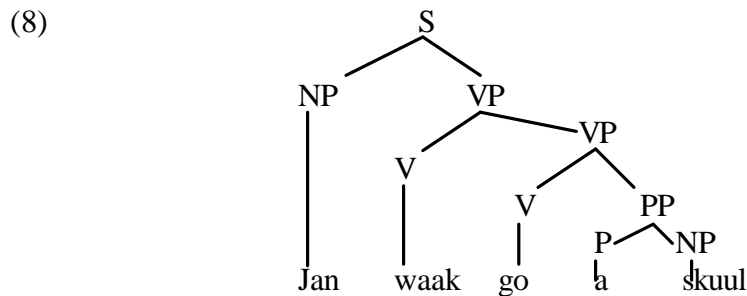(4) IVP   →   V[3]   IVP [MOD,DIR]
     V[3]   →   waka (walk), ron (run), …
(5) IVP [MOD] →   V[4] (IVP[MOD])
     V [4]   →   go (go), kon (come), …

Winford's ID rules
(6) VP   →   H[31] VP[DIR]
     H[31] →   waak, ron…

(7)   VP[DIR]   →   H[30] XP[LOC]
       H[30]   →   go, kon, …

The main difference between Sebba's and Winford's rules is that Winford assumes that the occurrences of intransitive verbs such as *go* 'go', *kon* 'come' as main verbs and as serial verbs are related to each other (1990:124). However, both Sebba's and Winford's rules are similar in that the serial verb phrase (*go a skuul* 'go to school' in (2)) is subcategorized for by the initial verb (*waak* 'walk' in (2)) which is considered the head. These rules can generate a VP which consists of a head verb and a serial VP complement. For example, the syntactic structure of (2), according to Winford (1990), can be represented in the tree in (8).

(8)
```
                        S
              ┌─────────┴─────────┐
             NP                   VP
              │            ┌───────┴───────┐
              │            V              VP
              │            │        ┌──────┴──────┐
              │            │        V            PP
              │            │        │        ┌────┴────┐
              │            │        │        P        NP
              │            │        │        │         │
             Jan         waak      go        a       skuul
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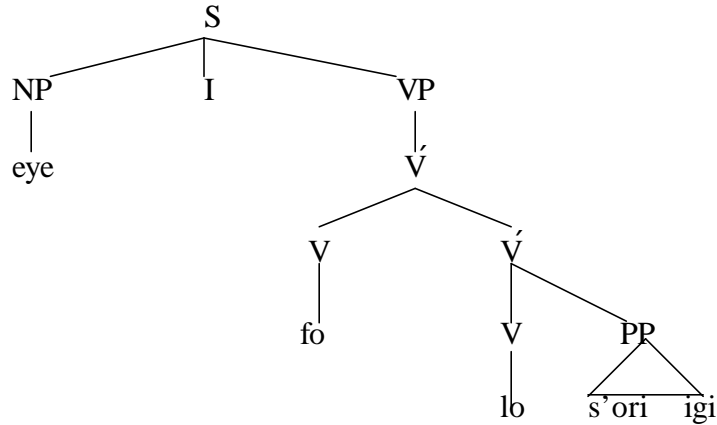
The structure in (8) should apply to (3) as well because in their analyses, Sebba and Winford categorize the serial verbs *go* 'go', *kon* 'come', and *fadon* 'fall', all to be in the same category of intransitive serial verbs.

In contrast to Sebba (1987) and Winford (1990), who suggest that verbs in Directional SVCs stand in a complementation relation, Baker (1989) suggests a double-headed verbal phrase structure for SVCs in Yoruba and Sranan where both heads theta-mark one NP argument. He applies this double-headed structure to SVCs that are related to motion events as well. Here I only concentrate on the syntactic structure and leave out the issue of theta-role assignment. Baker's analysis is illustrated in (9) and (10):

(9)   <u>Yoruba</u>   (example from Carstens, 1988)
       eye   fò   lo   s'órí   igi
       bird   fly   go   to-top tree
       The bird flew to the top of the tree.

(10)

```
                        S
          ┌─────────────┼─────────────┐
         NP             I             VP
          │                            │
         eye                           V́
                              ┌────────┴────────┐
                              V                 V́
                              │            ┌────┴────┐
                             fo            V        PP
                                           │      ┌──┴──┐
                                          lo   s'ori  igi
```

As I show in the next section, the analyses of SVCs by Sebba (1987), Winford (1990) and Baker (1989) cannot apply to Thai Directional SVCs, because the latter can include more than two verbs in a row and instantiate more than one syntactic structure.
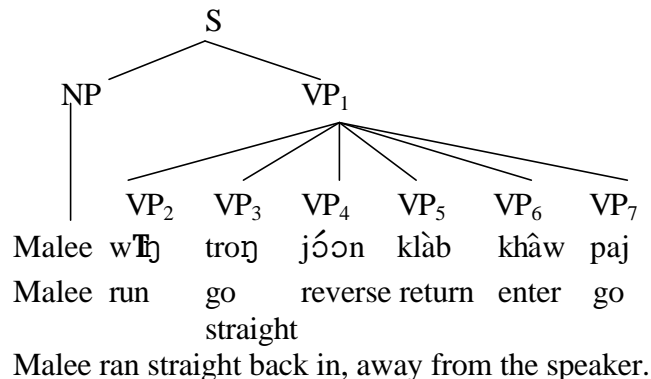
3. Constituent structure

Thepkanjana (1986) suggests that Thai Directional SVCs have a flat, iterative VP structure of the form VP → VP VP* (illustrated by the syntactic tree in (11)), and argues that when several verbs occur in this construction, they must conform to a constraint on linear order, as shown in Table 1:

Table 1 : Directional verbs and their specific linear order in SVCs (Thepkanjana (1986))

1 Manner-of-motion verbs (or verbs that entail motion)	*2* Geometric shape of the path	*3* Direction with respect to the previous path	*4* Direction with respect to the outside world		*5* Direction with respect to speech act participant
			4a Direction with respect to an object located in the outside world	*4b* Direction resulting from interaction between the path and the outside world	(deictic verbs)
Examples: *w̃iŋ* - run *dən* - walk *ʔaw* - take	Examples: *won* - circle *troŋ* - go straight	Examples: *jóon* - reverse *thǒɔj* - retreat	Examples: *ləəj* - pass *khâam* - cross *klàb* - return	*khâw* - enter *ʔɔ̀ɔk* - exit *khûn* - ascend *loŋ* - descend	*paj* - go *maa* - come

(11)

```
                          S
                    ┌─────┴─────┐
                   NP          VP₁
                    │    ┌───┬───┼───┬───┬───┐
                    │   VP₂  VP₃ VP₄ VP₅ VP₆ VP₇
                  Malee wîŋ troŋ jɔ́ɔn klàb khâw paj
                  Malee run  go  reverse return enter go
                           straight
```

Malee ran straight back in, away from the speaker.

In contrast to Thepkanjana, I argue below that more than one phrase structural schema is involved in Thai Directional SVCs and that verb complexes that form a Directional SVC do not necessarily occur in the order shown in Table 1.

3.1 Constituency tests

I apply two constituency tests: an adverb placement test and a 'do so' test. The adverb placement test shows that there can be a VP break after any verb in the sequence of verbs in a SVC construct except before the last verb when that verb is a deictic verb. The 'do so' test shows that the VP constituent picked up by the antecedent of 'do so' can be any number of verb complexes, as long as the deictic verb does not differ between the antecedent VP and the anaphoric VP. The two tests ultimately show that a sequence of Thai Directional SVC as the one in (1) is formed by two phrase structural schemata: a recursive VP-over-VP structure and a head-complement structure. In other words, Thai Directional SVCs involve two kinds of SVCs: *symmetric* and *asymmetric* SVCs, in the sense of Andrews and Manning (1999). All verbs in a symmetric serialization have equal status. Symmetric serialization is exemplified in Thai by the sequence of non-deictic verb complexes in Directional SVCs. Verbs in asymmetric SVCs do not have equal status (for example, one verb is the complement of the other) and the verb complex containing a deictic verb in Thai SVCs is an instance of asymmetric serialization.

- **Adverb placement test**

Adverbs in Thai normally occur at the end of or after the VP[2]. The placement of an adverb can be used to test where the VP break is in a SVC construct. In the following examples, I use the adverb *jàaŋkràʔjôŋkràʔjɛ̂ɛŋ* 'in limping manner', which semantically modifies manner-of-motion verbs (i.e. the first verb in (12)-(14)) to ensure that the adverb does not simply modify its immediately preceding verb.

(12) Malee dən(1) ʔɔ̀ɔk (4b) won(2) klàb(4a) jɔ́ɔn(3) paj(5)   *jàaŋkràʔjôŋkràʔjɛ̂ɛŋ*
     Malee walk   exit   circle return   reverse go   in limping manner
     Malee walked out, circling, back, away from the speaker, in limping manner.

(13) Malee dən(1)   won(2) jɔ́ɔn(3) *jàaŋkràʔjôŋkràʔjɛ̂ɛŋ* klàb(4a) khâw(4b) paj(5)
     Malee walk   circle reverse in limping manner   return enter   go
     Malee walked, circling, in limping manner, back in, away from the speaker.

(14) *Malee dən(1) ʔɔ̀ɔk (4b) won(2)   klàb(4a) jɔ́ɔn(3) *jàaŋkràʔjôŋkràʔjɛ̂ɛŋ* paj(5)
     Malee walk exit   circle   return reverse in limping manner   go
     (Intended meaning: Malee walked out, circling, back, in limping manner, away from the speaker)

I illustrate only some possible positions for the adverb *jàaŋkràʔjôŋkràʔjɛ̂ɛŋ* 'in limping manner' in the sentences in (12) and (13) above. Other positions of the adverb are possible, except the one in (14). The fact that (14), in which the adverb occurs between the next to last verb and the last verb which is the deictic verb, is ungrammatical shows that there cannot be a VP break between these two verbs. Otherwise, the adverb placement test shows that there can be a VP break after any verb in the sequence.

- **'Do so' test**

The anaphoric VP *tham jàaŋdiawkan* 'do so' or 'do the same' can be used to test the constituent structure of a complex VP, under the assumption that the antecedent of 'do so' or 'do the same' has to be a VP constituent.

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[2] I will not go into the details of how to decide on what is the exact position of adverbs in Thai. This is because wheter adverbs are VP-final or outside of the VP is irrelevant to my point.

(15) Malee wîŋ(1) jɔ́ɔn(3) klàb(4a) ʔɔ̀ɔk(4b) won(2) paj(5) lɛ́ʔ Piti kɔ̂ʔ
Malee run reverse return exit circle go and Piti then
tham jàaŋdiawkan troŋ(2) maa(5)
do so go straight come
Malee ran back out away, circling, and Piti did the same straight towards the speaker.

(antecedent = the first four verbs in sequence - run + reverse + return + exit)

(16) Malee wîŋ(1) jɔ́ɔn(3) klàb(4a) ʔɔ̀ɔk(4b) won(2) paj(5) lɛ́ʔ Piti kɔ̂ʔ
Malee run reverse return exit circle go and Piti then
tham jàaŋdiawkan loŋ(4b) troŋ(2) maa(5)
do so descend go straight come
Malee ran back out away, circling, and Piti did the same down straight towards the speaker.

(antecedent = the first three verbs in sequence – run + reverse + return)

(17) *Malee wîŋ(1) jɔ́ɔn(3) klàb(4a) ʔɔ̀ɔk(4b) won(2) paj(5) lɛ́ʔ Piti kɔ̂ʔ
 Malee run reverse return exit circle go and Piti then
tham jàaŋdiawkan maa(5)
do so come
(Intended meaning: Malee ran back out away, circling, and Piti did the same towards the speaker.

 Intended antecedent = the first five verbs in sequence – run + reverse + return + exit + circle)

The sentences (15) through (17), and other possible sentences with different numbers of verb complexes as the antecedent, show that *tham jàaŋdiawkan* 'do so' can pick up as its antecedent an initial verb or an initial verb plus any following sequence of serial verbs in a SVC construct so long as the deictic verb does not differ between the antecedent VP and the anaphoric VP, as is the case for the ungrammatical sentence in (17).

To summarize, the 'do so' test, as well as the adverb placement test, show that while there can be a VP break after any verb complex in a Directional SVC, there is no VP break between the deictic verb and its preceding verb. In other words, if a verb in a Directional SVC is followed by a deictic verb, the former will not form a VP constituent at the exclusion of the latter.

The constituent structure of Thai Directional SVCs is illustrated in examples (18) and (19):

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(18)   Malee wîŋ(1) jɔ́ɔn(3)   klàb(4a)   troŋ(2)   khâam(4a) saphaan   paj(5)
      Malee run   reverse   return   go straight   cross   bridge   go
      Malee ran back straight, crossing the bridge, away from the speaker.

(19)   (constituent structure of (18))


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                        S
                          _____ VP
                         VP        \
                        /  \        \
                      VP    \         \
                     /  \    \         \
                   VP    \    \          VP
                  / \     \    \        / | \
                NP  VP    VP   VP      V  NP  V
               Malee wîŋ(1) jɔ́ɔn(3) klàb(4a)  troŋ(2)   khaam(2) saphaan paj(5)
               Malee run  reverse return  go straight  cross    bridge  go
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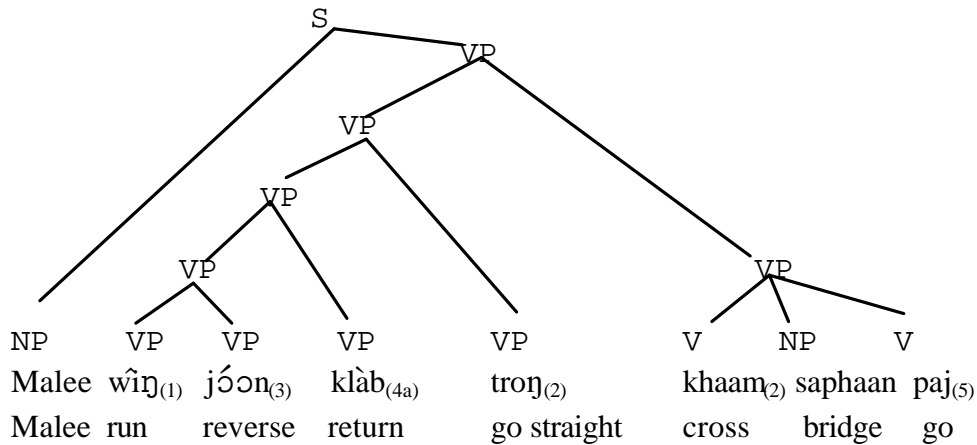
The structure of (18) illustrated in (19) shows that the constituent structure of Thai Directional SVCs cannot be reduced to most previous analyses of directional SVCs. Complementation approaches (Sebba, 1987 and Winford 1990), in which manner-of-motion verbs subcategorize for directional verbs, disallow recursive serialization. The multi-head analysis of Directional SVCs by Baker (1989), in which one V′ is embedded in another (asymmetrical heads), cannot apply to Thai Directional SVCs because it disallows recursiveness and also predicts a type of argument sharing that does not occur in Thai Directional SVCs[3].

Finally, contrary to the hypothesis of Thepkanjana (1986), the recursive structure in (19) predicts the possible reordering of verb complexes from the slots 1-4b in Table 1. This is indeed the case with one exception regarding the position of the manner-of-motion verbs (verbs from the slot 1 in Table 1), as discussed in details in the next section.

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[3] This is because Baker's multi-head analysis predicts that whatever argument occurs in the daughter V will be shared by the mother V′ as well, which is not borne out in Thai. For example, the argument *saphaan* 'bridge' in the verb complex *khâam saphaan* 'cross the bridge' in (1) is not shared by any other verb complex in the SVC sequence.

4. Ordering constraints

The VP-over-VP structure, supported by the adverb placement and the 'do so' tests, suggests the possibility of reordering verb complexes in a Directional SVC, since they do not stand in a head-complement relationship with respect to one another. Reordering the verb complexes is indeed possible, as (20)[4] shows. This is contrary to Thepkanjana's (1986) claim that verbs in this construction occur in the specific linear order shown in Table 1.

(20) a.
     (3) (4a)   (2)   (4b) (5)
  Piti jɔ́ɔn khâam saphaan troŋ   ʔɔ̀ɔk paj
  Piti reverse cross bridge go straight exit go

 b.
     (4a)   (2)   (3)   (4b) (5)
  Piti khâam saphaan troŋ   jɔ́ɔn ʔɔ̀ɔk paj
  Piti cross bridge go straight reverse exit go

 c.
     (4b) (2)   (4a)   (3)   (5)
  Piti ʔɔ̀ɔk troŋ   khâam saphaan jɔ́ɔn   paj
  Piti exit go straight cross bridge reverse go

(a) - (c) = Piti went back straight, crossing the bridge, out away from the speaker.

The examples in (20) are some of the possible reordering of verb complexes from slots 2-4b in Table 1. In fact, any reordering of verb complexes in a Directional SVC construct is possible with two exceptions. These involve the positions of manner-of-motion and deictic verbs. The first constraint concerns manner-of-motion verbs, which, if present, must occur first in the verb sequence, as illustrated in (21) - (22).

(21)
     (1) (4b) (5)
 a. Piti dən khɯ̂n paj
  Piti walk ascend go
  Piti walked up, away from the speaker.

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[4] Examples in (20) also show that a Thai Directional SVC construct does not necessarily contain a manner-of-motion verb. More examples are:

(i)
     (3) (4a)   (2)   (4b)   (5)
  Piti jɔ́ɔn khâam sàphaan troŋ khâw bâan paj
  Piti reverse cross bridge go straight enter house go
  Piti went back, crossing the bridge, straight into the house, away from the speaker.

(ii)
     (4a) (4b) (5)
  Piti klàb loŋ paj
  Piti return descend go
  Piti went back down, away from the speaker.

		(4b)	(1)	(5)
b.	*Piti	khûn	dən	paj
	Piti	ascend	walk	go
(22)		(1)	(3)	(5)
a.	Piti	wîŋ	jɔ́ɔn	maa
	Piti	run	reverse	come

Piti ran back, toward the speaker.

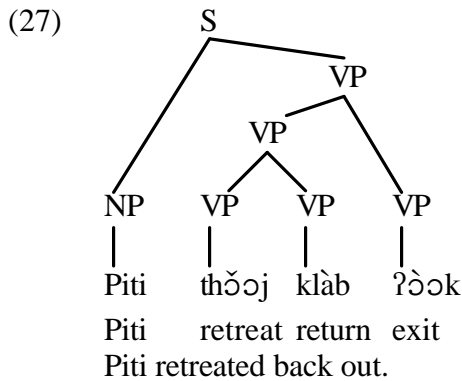|		(3)	(1)	(5)
b.	*Piti	jɔ́ɔn	wîŋ	maa
	Piti	reverse	run	come

The sentences in (21) and (22) show that the manner-of-motion verbs (or verbs from slot 1 in Table 1) must occur first in the SVC sequence. If they do not occur initially, the sentence is ungrammatical, as (21b) and (22b) show.

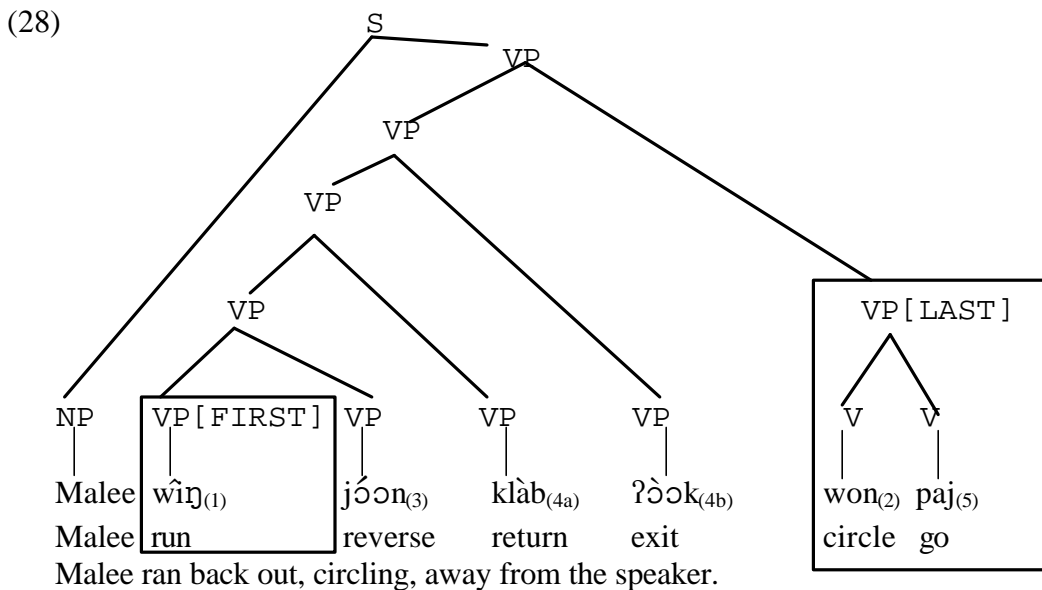The second constraint concerns deictic verbs, which, when present, must occur last in the SVC sequence.

(23) Piti wîŋ$_{(1)}$ khâam$_{(4a)}$ sà?phaan paj$_{(5)}$
Piti run cross bridge go
Piti ran across the bridge, away from the speaker.

(24) Piti paj$_{(5)}$ wîŋ$_{(1)}$ khâam$_{(4a)}$ sà?phaan
Piti go run cross bridge
Piti went to run across the bridge.

(25) Piti wîŋ$_{(1)}$ loŋ$_{(4b)}$ bandaj maa$_{(5)}$
Piti run descend stairs come
Piti ran down the stairs, toward the speaker.

(26) Piti wîŋ$_{(1)}$ maa$_{(5)}$ loŋ$_{(4b)}$ bandaj
Piti run come descend stairs
Piti ran to come down the stairs.

Example (23) and (25) contrasts with (24) and (26) in meaning. When the deictic verbs (*paj* 'go' and *maa* 'come) do not occur last in the SVC sequence and precede any other verb, they encode a purposive meaning, as shown in (24) and (26). The crucial difference is that while (23) and (25) encode a single event, (24) and (26) denote a sequence of two separate events, the second of which is not entailed to occur.

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Previous analyses of directional SVCs cannot account for the ordering constraints on Thai Directional SVCs. The subcategorization approaches of Sebba (1987) and Winford (1990) and the theta-role assignment approach of Baker (1989) predict a strict ordering of verb complexes in directional SVCs, since Thai is otherwise a rigid word order language. However, in Thai, if a Directional SVC construct contain neither manner-of-motion nor deictic verbs, a single schema of recursive VP-over-VP structure applies and generates the right result, as shown in the following figure:

(27)

```
                S
               / \
              /   VP
             /   /  \
            /   VP    \
           /   / | \   \
          NP  VP VP    VP
          |   |   |     |
        Piti thɔ̌ɔj klàb  ʔɔ̀ɔk
        Piti  retreat return exit
        Piti retreated back out.
```

The three verb complexes in (27), *thɔ̌ɔj* 'retreat', *klàb* 'return', and *ʔɔ̀ɔk* 'exit' can be freely reordered. The two ordering constraints bear on a SVC construct only when the construct contains a manner-of-motion verb and/or a deictic verb, as illustrated in (28):

(28)

```
                          S
                         / \
                        /   VP
                       /   /  \
                     VP   /    \
                    / \  /      \
                  VP   \         \
                 / \    \         \
               VP   \    \      VP[LAST]
              / \    \    \       /  \
            NP  VP[FIRST] VP  VP  VP  V    V
            |    |        |   |   |   |    |
          Malee wîŋ₍₁₎  jɔ́ɔn₍₃₎ klàb₍₄ₐ₎ ʔɔ̀ɔk₍₄ᵦ₎  won₍₂₎ paj₍₅₎
          Malee run    reverse return exit        circle go
          Malee ran back out, circling, away from the speaker.
```

It is not possible to impose a Linear Precedence (LP) statement on the recursive VP-over-VP structure to ensure the right ordering in (28), namely, to specify that the verb complex or VP containing the manner-of-motion verb *wîŋ* 'run' must occur first in the sequence and that the verb complex consisting of *won paj* "circle go' must occur last. This is because the schema that generates the recursive structure for Directional SVCs in (27) and (28) predicts free ordering of all verb complexes. As I illustrate in the next section, lexical classifications of heads and a **default** interpretation of the Head Feature Principle (HFP) are needed to model Thai Directional SVCs.

5. Syntactic Analysis of Thai Directional SVCs in Head-Driven Phrase Structure Grammar[5]

My analysis of Thai Directional SVCs makes use of: 1) rich featural specifications on heads to organize verb classes according to their ordering constraints, 2) a new schema for *co-headed phrases*, and 3) a **default** interpretation of the Head Feature Principle (cf. Sag, 2000), in which default head properties can be overridden by more specific information.

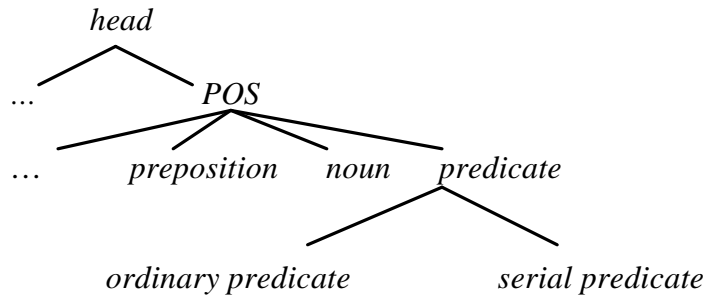First, the relevant portion of the Thai lexical type hierarchy I assume is shown in Figures 1 and 2:

Figure 1: A portion of Thai lexical type hierarchy

$$\text{serial predicate} \begin{bmatrix} \text{FIRST} & \text{boolean} \\ \text{LAST} & \text{boolean} \end{bmatrix}$$
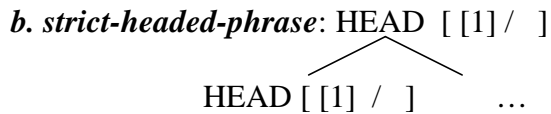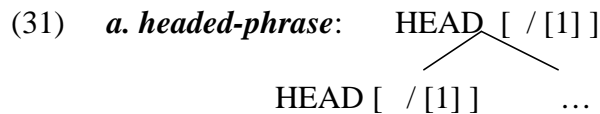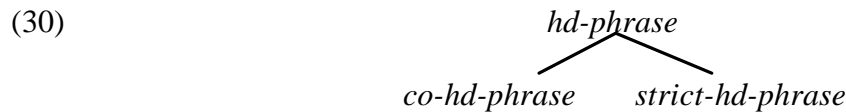
Figure 2: Type declaration for *serial predicate*

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[5] Due to space limitations, I do not include a semantic analysis of Thai Directional SVCs in this paper, but see Muansuwan (in preparation) for details on this issue.

There are two types of predicates in Thai: *ordinary predicate* and *serial predicate*. The latter type refers to predicates that can occur in a SVC. Moreover, predicates that can occur in a Thai Directional SVC specify differently the value of the features FIRST and LAST, as shown in (29):

(29) - manner-of-motion verbs or verbs that entail motion are lexically marked as $\begin{bmatrix} \text{FIRST} & + \end{bmatrix}$, meaning that a VP headed by a verb from this class must occur first in the SVC.

- verbs that take a deictic verb as complement[6] are lexically marked as $\begin{bmatrix} \text{LAST} & + \end{bmatrix}$, meaning that a VP headed by a verb from this class must occur last in the sequence of verb complexes.

- other non-deictic serial verbs are lexically marked as $\begin{bmatrix} \text{FIRST} & \text{boolean} \\ \text{LAST} & \text{boolean} \end{bmatrix}$, meaning that they are not constrained in their order of occurrence.

Second, the phrase structural schema licensing the Thai Directional SVC is defined as a *co-headed phrase*. A *co-headed phrase* is a subtype of *headed-phrase*[7]. I assume, as Sag (2000) does, that the Head Feature Principle is a **default**, as illustrated in (30) and (31):

(30)   *hd-phrase*

          co-hd-phrase   *strict-hd-phrase*

(31)   ***a. headed-phrase***:   HEAD [/ [1]]

                    HEAD [/ [1]]   …

       b. strict-headed-phrase: HEAD [[1] /]

                    HEAD [[1] /]   …

---

[6] As the two syntactic tests showed, a deictic verb forms an immediate constituent with (i.e. is a complement of) its preceding verb. The deictic verb is added to a motion-related verb via a lexical rule or by being added through the combination of the motion-related verb with a lexeme class.

[7] But it is neither a *head-adjunct* nor a *head-nexus* (see Sag, 1997).

c. co-headed-phrase[8]:

$$\text{HEAD} \begin{bmatrix} \text{FIRST} & [1] \\ \text{LAST} & [2] \end{bmatrix}$$
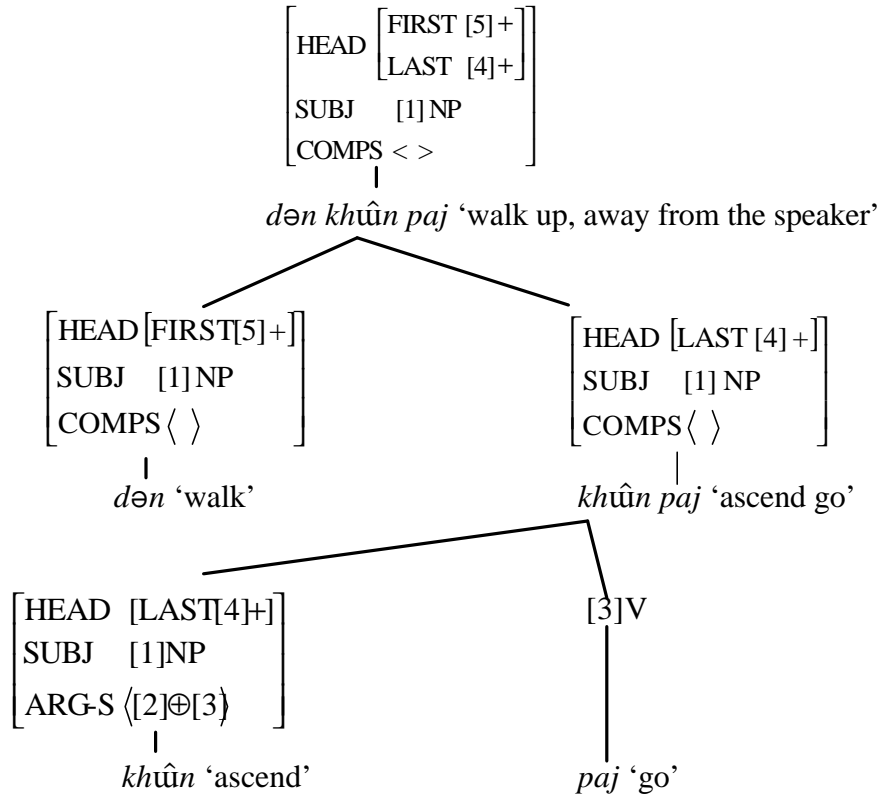
$$\text{HEAD} \begin{bmatrix} \text{FIRST} & [1] \\ \text{LAST} & - \end{bmatrix} \qquad \text{HEAD} \begin{bmatrix} \text{FIRST} & - \\ \text{LAST} & [2] \end{bmatrix}$$
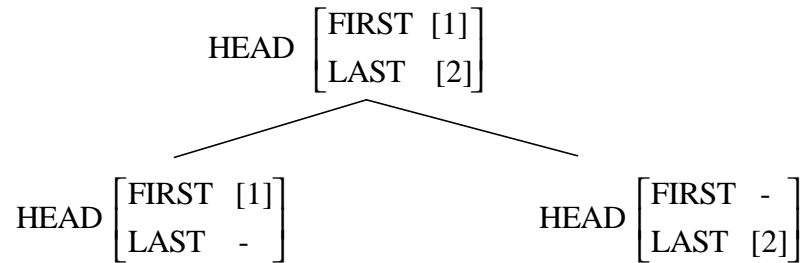
Assuming that the structure-sharing of head properties between the head daughter and the mother is a **default**, it is possible to specify which head features of which daughter are structure-shared with the mother node (as opposed to the traditional percolation of all head features from a single head daughter). The lexical specifications in (29), together with the *co-headed-phrase* schema, yield the desired results: they generate a recursive VP-over-VP structure, ensure the right ordering of verb complexes and guarantee that the subjects of all VPs are shared (in accordance with the Valence Principle of Sag 1997). The simplified trees in (32) and (33) for the VPs *dən khûn paj* 'walk up, away from the speaker', and *dən jɔ́ɔn khûn paj* 'walk back up, away from the speaker', respectively, illustrate this fact.
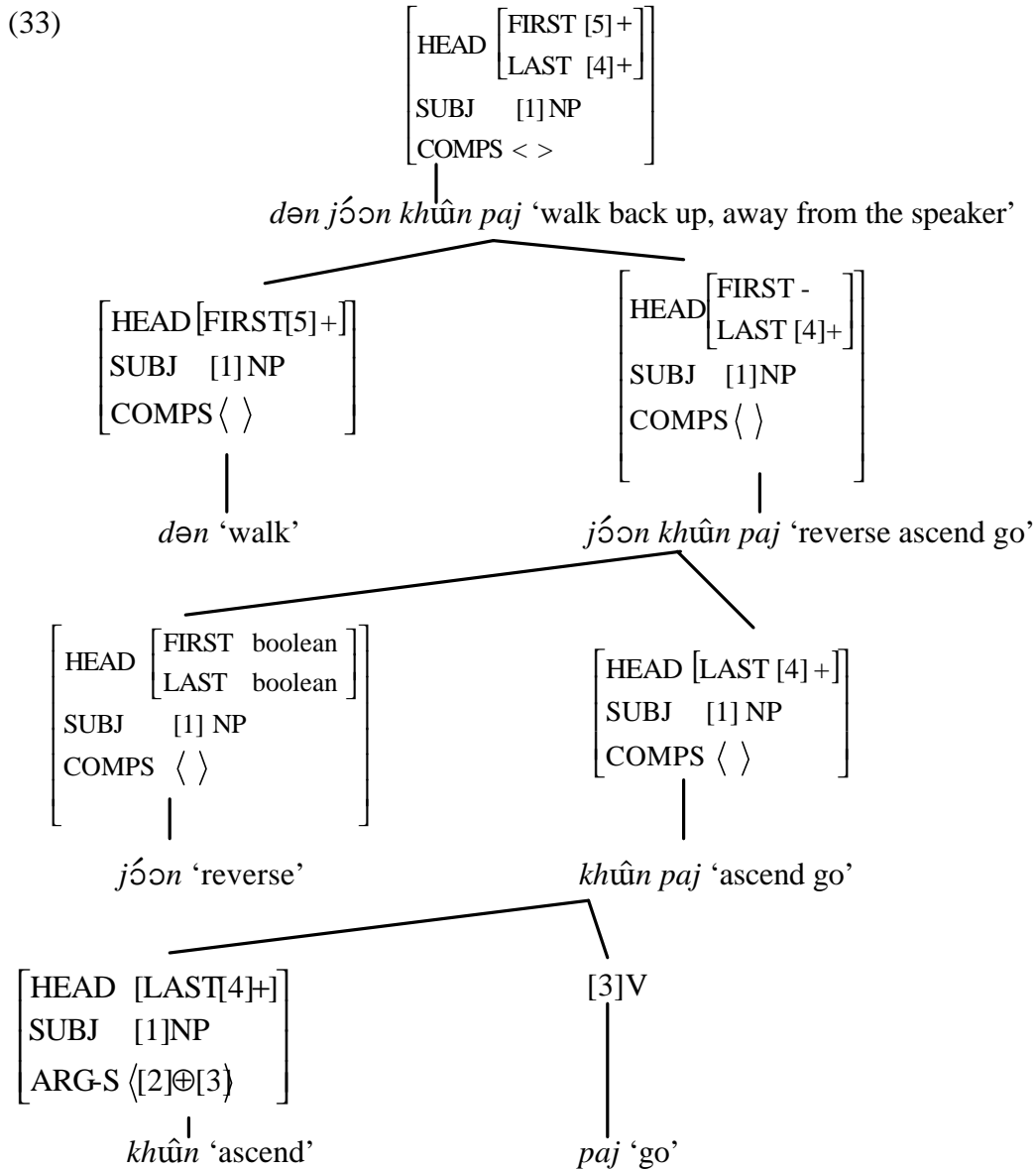
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[8] As pointed out to me by Emily Bender (p.c.), one drawback of this schema is that it leads to spurious structural ambiguities, an issue that I will not address further in this paper.

(32)

$$
\begin{bmatrix}
\text{HEAD} & \begin{bmatrix} \text{FIRST [5]}+ \\ \text{LAST \ [4]}+ \end{bmatrix} \\
\text{SUBJ} & \text{[1] NP} \\
\text{COMPS} < >
\end{bmatrix}
$$

|
dən khɯ̂n paj 'walk up, away from the speaker'

$$
\begin{bmatrix}
\text{HEAD} & [\text{FIRST[5]}+] \\
\text{SUBJ} & \text{[1] NP} \\
\text{COMPS} & \langle\ \rangle
\end{bmatrix}
\qquad
\begin{bmatrix}
\text{HEAD} & [\text{LAST [4]}+] \\
\text{SUBJ} & \text{[1] NP} \\
\text{COMPS} & \langle\ \rangle
\end{bmatrix}
$$

| |
dən 'walk' *khɯ̂n paj* 'ascend go'

$$
\begin{bmatrix}
\text{HEAD} & [\text{LAST[4]}+] \\
\text{SUBJ} & \text{[1]NP} \\
\text{ARG-S} & \langle\text{[2]}\oplus\text{[3]}\rangle
\end{bmatrix}
\qquad\qquad
\text{[3]V}
$$

| |
khɯ̂n 'ascend' *paj* 'go'

The constituent *khɯ̂n paj* 'ascend go' is formed by the Head-Complement Schema (Pollard and Sag, 1994). This schema combines *khɯ̂n* 'ascend' with paj 'go' because the augmented valence of *khɯ̂n* 'ascend' requires it to take a deictic verb. The augmented-valence variant of the verb *khɯ̂n* 'ascend' is lexically marked as [LAST +]. The overall VP *khɯ̂n* 'ascend' heads is therefore marked as [LAST +] in accordance with the constraints on the *strict-headed-phrase*. The verb *dən* 'walk' combines with *khɯ̂n paj* 'ascend go' by the *co-headed-phrase* schema to form the complex VP *dən khɯ̂n paj* 'walk up, away from the speaker'. The verb complex *dən* 'walk' is lexically marked as [FIRST +] and this ensures its initial position in the SVC sequence, as opposed to the verb complex *khɯ̂n paj* 'ascend go', which is marked as [LAST +] and which must

therefore occur last in the sequence, in accordance with the constraints on the *co-headed-phrase* schema.

(33)

$$\begin{bmatrix} \text{HEAD} & \begin{bmatrix} \text{FIRST } [5]+ \\ \text{LAST } [4]+ \end{bmatrix} \\ \text{SUBJ} & [1]\,\text{NP} \\ \text{COMPS} < > \end{bmatrix}$$

dən jɔ́ɔn khɯ̂n paj 'walk back up, away from the speaker'

$$\begin{bmatrix} \text{HEAD} & [\text{FIRST}[5]+] \\ \text{SUBJ} & [1]\,\text{NP} \\ \text{COMPS} & \langle\ \rangle \end{bmatrix}$$

$$\begin{bmatrix} \text{HEAD} & \begin{bmatrix} \text{FIRST -} \\ \text{LAST } [4]+ \end{bmatrix} \\ \text{SUBJ} & [1]\text{NP} \\ \text{COMPS} & \langle\ \rangle \end{bmatrix}$$

dən 'walk'

jɔ́ɔn khɯ̂n paj 'reverse ascend go'

$$\begin{bmatrix} \text{HEAD} & \begin{bmatrix} \text{FIRST} & \text{boolean} \\ \text{LAST} & \text{boolean} \end{bmatrix} \\ \text{SUBJ} & [1]\ \text{NP} \\ \text{COMPS} & \langle\ \rangle \end{bmatrix}$$

$$\begin{bmatrix} \text{HEAD} & [\text{LAST } [4]+] \\ \text{SUBJ} & [1]\ \text{NP} \\ \text{COMPS} & \langle\ \rangle \end{bmatrix}$$

jɔ́ɔn 'reverse'

khɯ̂n paj 'ascend go'

$$\begin{bmatrix} \text{HEAD} & [\text{LAST}[4]+] \\ \text{SUBJ} & [1]\text{NP} \\ \text{ARG-S} & \langle[2]\oplus[3]\rangle \end{bmatrix}$$

$[3]\text{V}$

khɯ̂n 'ascend'

paj 'go'

The difference between (32) and (33) is that the *co-headed-phrase* schema applies twice in (33) but once in (32). In (33), the schema first combines *khɯ̂n paj* 'ascend go' with *jɔ́ɔn* 'reverse', and then combines *jɔ́ɔn khɯ̂n paj* 'reverse ascend go' with *dən* 'walk'. The verb complex *jɔ́ɔn* 'reverse' is underspecified with respect to the features FIRST and LAST. Therefore, when this verb combines with *khɯ̂n paj* 'ascend go', the latter percolates its specific values [LAST+] to the VP it co-heads, in accordance with the *co-headed-phrase* schema. Also,

the VP *jɔ́ɔn khɯ̂n paj* 'reverse ascend go' is [FIRST -] as a result of the constraints from the *co-headed-phrase* schema. Other than these, the combination of verb complexes proceeds as in (32).

6. Conclusion

Thai Directional SVCs illustrate a new kind of SVC whose structure is not reduceable to previously described SVCs. They consist of both a VP-over-VP structure (generated by a new *co-headed-phrase* schema) and a complementation structure. Furthermore, Thai Directional SVCs look like a challenge to the assumption that Thai has a rigid word order because within a SVC structure, there are both verb complexes which can be reordered and others whose position are fixed. Nevertheless, I have shown that this challenge is not a real one since the free-ordering is the result of the co-headed structure. The fixed positions are then determined by **lexical** categorizations of verbs, as predicted in rigid word order languages. It should be noted, however, that Thai Directional SVCs exhibit a dissociation between constituent structure and linear order that cannot be modeled by simple category information, by syntactic mechanisms involving argument structure typical of previous analyses of Directional SVCs (Sebba, 1987; Winford, 1990; Baker, 1989), or by the use of simple phrase structure rules of the form A → B C, which can only encode the linear relations among sister constituents. Nonetheless, within HPSG, the rich featural specifications of heads and the mechanisms available for the percolation of specific head properties in a default interpretation of the Head Feature Principle allow for a straightforward model of Thai Directional SVCs.

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