LEFT PERIPHERAL DELETION, OBJECT GAPPING AND THE INTERNAL STRUCTURE OF SERIAL VERB CONSTRUCTIONS

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Abstract

This paper is mainly concerned with left peripheral deletion, object gapping and the internal structure of serial verb constructions (SVCs). SVCs arise from the deletion of the conjunction between two clauses and left peripheral deletion. Left peripheral deletion triggers the movement of VP1's Spec to the Spec of IP and the occurrence of VP2's Spec as pro, as a result of which VP1 asymmetrically c-commands VP2. Object gapping triggers the ATB movement of VP2 to generate various types of SVCs. It is argued that the differences between coordinative constructions, pivotal constructions and SVCs lie in their internal structure but not in the verb position.

Key concepts: left peripheral deletion; object gapping; asymmetrical c-command; ATB movement; Verb position

1.0 Introduction

Serial verb constructions (SVCs) are phenomena that occur cross-linguistically in a number of the world's languages; they occur most frequently in African, Asian, and Creole languages of the Atlantic and Pacific. They have been extensively discussed in the literature on African and Chinese linguistics (Stahlke, 1970; Schachter, 1974; Li & Thompson, 1981; Sebba, 1987; Baker, 1989; Dai, 1990; Chang, 1990; Schiller, 1991; Lefebvre, 1991; Liu, 1997; Kari, 2003; Aikhenvald 2005; Li, 1991, 2007; Yang, 2009, 2012; Müller & Lipenkova, 2009; Tao, 2009; Yin, 2007; among others). Throughout these various studies in theoretical linguistics, the generation of SVCs of various types of languages has never been viewed in syntactic terms.

The aim of this paper is to carry out research into the internal structure and typology of SVCs in terms of left peripheral deletion and object gapping and analyze the differences between SVCs, coordinate constructions, and pivotal constructions[1]. The paper is organized as follows. Section 2 discusses the

[1] A pivotal construction is one in which the object of the first verb is at the same time the subject of the following verb. This object therefore functions as a pivot, connecting the two verb clauses in the construction.

generation mechanism of SVCs in terms of left peripheral deletion and object gapping. Section 3 discusses the typology of SVCs in terms of object gapping and overt verb raising. Section 4 discusses the internal structure of SVCs. Section 5 concludes the paper.

2.0 Left Peripheral Deletion Object Gapping and Generation of SVCs SVCs
These refer to phrases which contain a sequence of verbs or verb phrases without any coordinating or subordinating markers intervening between them in the form of "S + V1 + (NP1) + V2 + (NP2)". The order within the phrase is VO or OV; no constituent with different syntactic quality can intervene between the head and the object; constituents with different syntactic quality can intervene between the subject and the predicate. The verbs within the SVC must share their object (Baker, 1989).

In other words, the SVC is a complex predicate structure formed by two or more verbal phrases which select for the same subject. There is no syntactic marking available for the specification of the relation between the verbs. Semantically, a specific relation holds between the described events (Müller & Lipenkova, 2009). The verbs can follow the same subject and function as the predicates of the subject; V1 is the first predicate and V2 the second predicate. The verbs describe what can be conceptualized as a single event (Yang, 2009). Both verbs must be lexical in that they must both be able to function independently with a clause as verbs in their own right. Both constituent verbs within the SVC must be interpreted as having the same categories of tense-aspect-mood if there is any possibility of the two being conceived as expressing independent events. There must be no marking of a clause boundary between the two verbs.

There should be no conjunction appearing between the two verbs (Sebba, 1987). According to Qi *et al* (1993:239) and Matthews (2000:339), the features of SVCs are as follows: two or more verbs are joined together with no connecting particle, clitic, etc. or no phonetic pause; all the actions are made by the same agent or occur in succession; the subsequent action functions as the purpose of the prior action, or the subsequent action functions as the manner of the prior action. As a construction composed of a chain of semantic and grammatical categories, it describes a complete event, which may be composed of two or more sub-events (Dai & Qiu, 2008). Formally and semantically, an SVC must satisfy the following conditions: (1) an SVC consists of more than one verb, but the SVC is conceived of as describing a single action; (2) there is no mark of linkage or subordination in an SVC; (3) each verb in an SVC may also occur as the sole verb in a clause; (4) An SVC functions like a single predicate; (5) an SVC will generally have its own transitivity value; (6) there must almost always be (at least) one argument shared by all the verbs in an SVC; (7) The verbs in an SVC may make up one word, or

may remain separate words; (8) the components of an SVC may be contiguous or non-contiguous (cf. Dixon, 1997:339-344). The Chinese SVC is composed of two verbal phrases. They follow each other without an overt syntactic marking of the semantic relation between the described events. Thus we argue that an SVC is generated via a combination of two clauses. The conjunction functioning as the connecting device between the two clauses is deleted, and the left peripheral is also deleted, which gives rise to an SVC, as illustrated in (1):

1 (a) *wo zhong cai*
1SG plant vegetable
I plant vegetables.

(b) *wo mai cai*
1SG sell vegetable
I sell vegetables.

(c) *wo zhong cai* + *wo mai cai*
1SG plant vegetable 1SG sell vegetable.

(d) *wo zhong cai mai*
1SG plant vegetable sell
I plant vegetables to sell.

As (1) shows, V1 is the major predicate, which has the syntactic features and carries semantic weight. V2 is the secondary predicate, which has no syntactic features and carries no semantic weight, because V2 has grammaticalized. In other words, VP2 is subordinate to VP1 and functions as the argument of VP1 (Yang, 2009, 2012). The derivation can be shown as (2). (2) [VP1VP1 VP2]. It follows that an SVC should be regarded as an IP headed by VP1. Rather, IP is the maximal projection of VP1. IP entails VP1 and VP2, between which there is no coordinate relation. Instead, there is subordinate relation between VP1 and VP2. VP1 c-commands VP2, and VP1 and VP2 share the same subject, which is situated in a high c-command position. It is noteworthy that an SVC should not be seen as a structure containing two IPs, because it has only one subject which dominates both VP1 and VP2. In fact, an SVC is composed of two VPs. The verb moves across the board (ATB)[2] to I, and the subject of VP1 and VP2 raises to [Spec IP], as shown in (3). (3) [IP Subji [I` I-V1j [VP1 ti [V` tj O1][VP2 ti [V` V2 O2]]]]].

[2] In general one cannot extract a single conjunct, though extraction from the conjuncts in an ATB fashion is permissible (Ross, 1967; Jackendoff, 1977; Williams, 1978; Gazdar, Pullum, Sag, & Wasow, 1982; Sag, Gazdar, Wasow, & Weisler, 1985; Goodall, 1987; Mumn, 1993). An (2006) argues that ATB constructions are derived by applying deletion in PF to a full sentential oordinate structure. Coordinate deletion is sensitive to periphery. It implies that the element deleted should

As (3) shows, V1 moves to and merges with I, and V2 remains in situ. The advantages of this analysis are as follows: 1) An SVC is not a coordinate construction or adjunct construction but a subordinate construction. 2) V1 and V2 in an SVC project VP1 and VP2, which are entailed in the same IP, as a consequence of which they share the same subject and its constituents, including tense, modal verbs, negative operators, and adverb modifiers. Obviously the analysis gives a reasonable account of the scope and variable binding of SVCs and hence overcomes the shortcoming of the conventional IP explanation of SVCs. Furthermore, it can account for other SVC phenomena, for example, V1 and V2 share the same subject but they do not share the same object. Subject sharing is a striking characteristic of SVCs and hence it is an obligatory condition of SVCs. In contrast, object sharing is not an obligatory feature of SVCs. Object sharing depends on the governing capability and scope of V1 and V2 as well as the occurrence of the object. However, VP1 dominates VP2, which is in a subordinate status. VP1 is in a governing status because V1, as the major predicate, bears tense/aspect markers and carries semantic weight. VP2 is in a subordinate status because V2 is the subordinate predicate or secondary predicate, which bears no tense/aspect markers and carries no semantic weight (Yang, 2009). The analysis also makes the correct prediction that VP2 cannot be modified by S-adverbs and VP adverbs. If VP2 is an IP, SVCs are ungrammatical.

Thus, left peripheral deletion is the prerequisite to the generation of SVCs via combination of two clauses. Since an SVC has only one IP, headed by VP1, V1 can bear tense/aspect markers *guo* and *le* while V2 cannot. Therefore only one verb, i.e. V1, can bear tense/aspect markers and function as the major predicate.

4 (a) Zhangsan maiguo yige baozi chi
Zhangsan buy-PST one-CLASS steamed-stuffed-bun eat
Zhangsan bought a steamed stuffed bun to eat.

(b). *Zhangsan mai yige baozi chiguo
Zhangsan buy one-CLASS steamed-stuffed-bun eat-PST.

5 (a) Zhangsan bale yige luobo mai
Zhangsan pull-PST one-CLASS turnip sell
Zhangsan pulled a turnip to sell.

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appear in the peripheral position or edge of the relevant portion of the structure. Furthermore, if an edge element is deleted, then the next element adjacent to the deletion site is considered to be peripheral and is subject to further deletion (up to other constraints such as identity).

(b) *Zhangsan ba yige luobo maiguo
Zhangsan pull one-CLASS turnip sell-PST.

(4) - (5) show that VP2 does not qualify as IP. If we compare coordinate constructions, pivotal constructions and SVCs, we will find that they are all generated on the basis of left peripheral deletion but there are differences between them. The differences between them are shown in (6) - (8):

(6) [IP Speci [I`I [vP Speci [v`VP [VP1Speci [V`V1 NP1][VP2Speci [V`V2 NP2]]]]]] SVC.

7(a) [IP1Speci[I`I[VP1Speci[V`V1NP1][IP2Specj [I`I [VP2Specj [V`V2NP2]]]]]]] coordinate construction.

(b) [IP Speci [I`I [IP1Speci [I`I [VP1Speci [V`V1 NP1][IP2Speci [I`I [VP2Speci [V`V2 NP2]]]]]]]].

(8) [IP Speci [I`I [vP Speci [v`V1 [VP1Specj [V` proj [VP2 V2 NP]]]]]]] pivotal construction The construction in (6) is an SVC, in which VP1 and VP2 share the same subject but do not necessarily share the object.

The constructions in (7) are coordinate constructions. In 7(a), IP1 and IP2 they do not share the same subject, whereas in (7b) IP1 and IP2 they share the same subject. The construction in (8) is a pivotal construction, in which the internal argument of VP1 is the external argument of VP2, and it occurs as pro. VP1's Spec is of dual property, i.e. it functions as V1's object and V2's subject. Thus the left peripheral deletion between the two clauses may give rise to two types of constructions. If VP1 and VP2 share the same subject, and V1 and V2 share the internal argument, an SVC may be generated. If VP1 and VP2 do not share the same subject, and V1 and V2 share the same NP, which functions as the internal argument of V1 and the external argument of V2, a pivotal construction may be generated.

A subject sharing coordinate construction may generate an SVC if the conjunction and the left peripheral are deleted. VP2, whose subject occurs as pro, is embedded in VP1. Hence VP2 is subordinate to VP1 and hence c-commanded by VP1. In this process, VP2's subject and VP1's subject merge into VP's subject, which moves to [Spec IP]. VP2's subject and VP1's object in a subject sharing coordinate construction incorporate as an overt NP, which has two functions: VP1's object and VP2's subject. As a result, a pivotal construction is generated. A coordinate

construction entails two IPs, which both bear tense/aspect markers. If VP1 and VP2 do not share the same subject, there are two different subjects. If they share the same subject, only VP1's subject can occur overtly but VP2's subject has to occur as pro, which co-refers with and is controlled by the overt subject. An SVC entails an IP, which entails a vP and a VP. vP's Spec moves to occupy [Spec IP]. The subject governs vP and VP. VP is c-commanded by vP and functions as its internal argument. A pivotal construction entails a VO structure, i.e.V1O1, and a SV structure, i.e. S2V2. S2 is equal to O1. V1's object and V2's subject incorporate as an overt object NP, which also functions as V2's subject. Thus a coordinate construction implicates an SVC and a pivotal construction, viz. coordinate construction⊃ C and coordinate construction⊃ pivotal construction. The generation of SVCs and pivotal constructions undergoes left peripheral deletion, object gapping, and the syntactic operation process during which VP2 is embedded in VP1 or VP2 and VP1 merge and incorporate. The difference between them lies in the following aspect: an SVC is resulted from the merger and incorporation of IP1's subject and IP2's subject in a coordinate construction, whereas a pivotal construction is resulted from the merger and incorporation of IP1's object and IP2's subject in a coordinate construction. The former is the result of incorporation of the external arguments while the latter is the result of incorporation of the internal argument and the external argument. SVCs in Chinese, Japanese, and Korean belong to this class. SVCs in Miskito and Sranan, however, belong to the other class, i.e. the external argument and the internal argument merge and incorporate, but the internal argument and the internal argument do not merge and incorporate (Yang, 2009; Li, 1991, 2007; Baker, 1989).

3.0 Object Gapping and the Overt Verb Raising

The object gapping of SVCs is the root cause of V-I movement. If object gapping is present in SVCs in a language, V can raise to I. Conversely, if object gapping is not present in SVCs in a language, V cannot raise to I. Specifically, object gapping is not present in Chinese SVCs, whereas object gapping is present in SVCs in Tibeto-Burman languages. Hence the former does not undergo overt V-I movement while the latter undergoes overt V-I movement. Take *wo zhongguo cai mai* for example. The generation of this sentence undergoes the following syntactic operation process: The combination of the two clauses *wo zhongguo cai* and *wo maiguo cai* gives rise to the sentence *wo zhongguo cai* CONJ[3] *wo maiguo cai*. According to the definition of the SVC, there is no connective device between the VPs. Hence the conjunction must be deleted, which yields *wo zhongguo cai* CONJ *wo maiguo cai*. The deletion of the conjunction results in the left peripheral

[3] 3 CONJ stands for conjunction

deletion of the second clause. According to the postulation that the verbs of the SVC share the same subject, the subject of the second clause has to occur covertly, viz. pro, which yields *wo zhongguo cai* pro *maiguo cai*. Since only one of the verbs can occur as the major predicate of the SVC and bear the tense/aspect marker *guo*, the tense/aspect marker *guo* of the second clause must be deleted. On the other hand, the verbs in the two clauses share the same object, the object in the second clause must be deleted to avoid syntactic redundancy. As a consequence, *wo zhongguo cai mai* is generated. It can be seen that Chinese SVCs undergo no object gapping but object deletion. Thus overt V-I movement does not occur. In contrast, Yi, Qiang, Kazhuo, Hani, and Lahu, which belong to the Tibeto-Burman family, undergo object gapping, and hence V moves to I overtly, as illustrated in (9):

9 (a) [IP ŋu33
i[I` I [vP t i [v` v[VP Speci [V` thi21
I[VP ʂu33
j [V` li21[VP tO2 tV2]]]]]]]]]
1SG 3SG look-for go
I'll go to look for him.

(b) [IP ŋa33
i [I` I [vP t i [v` v[VP Speci [V` thu33ku33
i[VP fɛi33
j[V` so24[VP tO2 tV2]]]]]]]]]
1SG collar embroider learn
I learn to embroider the collar.

As (9) shows, O1 is null, and O2 moves to O1 in order to receive a thematic role. In order to assign O2[4] a theta-role, V2 moves to v and merges with it, which gives rise to a combination S+O2+V2+V1. If O1 is not null, there is no motivation for O2 and V2 to move. Thus object gapping is the root cause of overt verb raising. Object movement in SVCs is A-movement, which follows the Coordinate Structure Constraint (CSC) proposed by Ross (1970). Both A-movement and verb movement are characteristic of ATB (Bošković, 1997). If O1 is null, or rather, O1 has no feature [+ACC], O2 and V2 will move to [NP V`] and [V VP] respectively, as illustrated in (10):

10 (a) ŋu33 Φ[-ACC] li21 thi21 ʂu33
→ ŋu33 thi21 ʂu33 li21

[4] Ferguson (1996) points out that overt object raising is associated with overt verb raising because the verb checks the object. If the object raises, the verb also raises.

(b) ŋa33[-ACC] so24 thu33 ku33 fɛi33
→ ŋa33 thu33 ku33 fɛi33 so24

According to Chomsky (1995), the structure of VP is [vP[VP]]. The verb moves overtly to the light verb v, but it does not raise to the position I. The subject is base-generated in the position [Spec vP] and the object is base-generated in the position [Spec VP]. This analysis sees SVCs as vP/VP instead of VP/VP. The verb moves across the board to the light verb v, and vP or VP is the internal 3 CONJ stands for conjunction. 4 Ferguson (1996) points out that overt object raising is associated with overt verb raising because the verb checks the object. If the object raises, the verb also raises. 6 structure of the whole syntax. In vP the constituent in the Spec position is the subject while in VP it is the object. SVCs in Tibeto-Burman languages undergo both object gapping and left peripheral deletion. Furthermore, SVCs in all languages undergo object gapping and ATB movement, which result from left peripheral deletion. VP2 functions as vP in terms of object gapping and functions as VP in terms of ATB movement.

According to the economy principle of language processing, VP/VP is a completely symmetrical coordinate structure. But vP/VP is different. It is noteworthy that vP/VP is not a licensing condition. Japanese, Korean, Yi, Qiang, Hani, Kazhuo, and Lahu are all SOV languages. Why do Japanese and Korean have only the word order S+O1+V1+V2 while Yi, Qiang, Hani, Kazhuo, and Lahu have both word order S+V1+O1+V2 and S+O2+V2+V1We argue that this is due to object gapping, or rather, O1 gapping. It can be inferred that O1 gapping is the prerequisite to the generation of S+O2+V2+V1. According to Yang (2009), in SVO-type SVCs, the aspect marker is generated in [V v`]. V1 moves from [V VP] to [V v`] and merges with the aspect marker. The subject is generated within vP. It moves to [Spec IP] to satisfy the EPP feature. O1 and O2 are in [NP1 VP] and [NP2 VP] respectively, as shown in 11(a). In SOV-type SVCs, V1 remains in situ and V2 is in [V v`], as shown in 11(b). The subject is generated within vP. It moves to [Spec IP] to satisfy the EPP feature. O1 and O2 are in outer [NP1 v`] and inner [NP2 v`] respectively. If O1 is null, O2 and V2 move to outer [NP V`] and [V VP] respectively, as shown in 11(c):

11 (a) [IP Speci [I` I [vP t i [v` v-V[VP Speci [V` tV1 [VP NP[V`V NP]]]]]]]]
S V1 O1 V2 O2

(b) [IP Speci [I` I [vP t i [v` v [VP Speci [V` NP [VP V [V` NP V]]]]]]]]
S O1 V1 O2 V2

(c) [IP Spec i [I` I [vP t i [v` v[VP Speci [V` NP [VP V[V` V[VP tO2 tV2]]]]]]]]]
S O2 V2 V1

As (11) shows, in SVO-type SVCs the verb moves to v and merges with it, whereas in SOV-type SVCs the verb remains in situ. Thus in SVO-type SVCs, even if O1 is null, O2 and V2 cannot be triggered to move to the position preceding V1, as a consequence of which SO2V2V1 cannot be generated. In SOV-type SVCs, if O1 is null, or if O1 has feature [-ACC], O2 and V2 raise to the positions [NP V`] and [V VP] respectively, as shown in (12). Therefore the generation of SO2V2V1 depends on whether O1 has feature [-ACC] or not.

12 S O2i V 2j V1 ti tj

13 (a) Chelswu-ka chayksang-ul [+ACC] twutulki-e pwusi-ess-ta Korean
Chelswu-NOM table-ACC beat break-PST-DEC
Chelswu broke the table.
→* Chelswu-ka chayksang-ul pwusi-ess-ta twutulki-e

(b) John Mary-ra [+ACC] pruk-an Bill plap-an Miskito
John Mary-ACC beat Bill run-PST
John beat Mary, and Bill ran.
→* John Mary-ra Bill plap-an pruk-an

(c) Áràú ingo [+ACC] dérì pite-mí Ijo
3SG net knit set-PST
She knitted and set the net.
→*Áràú ingo pite-mí dérì

14 (a) the: Φ[-ACC] topu fa xsə guə Qiang

3SG clothes new wear like
He likes to wear new clothes
→ the: fa xsə guə topu

(b) ŋa55 Φ[-ACC] li33 xo31 tɕa31 Hani
1SG rice cook go
I went to cook rice.
→ ŋa55 xo31 tɕa31 li33

(c) ŋa31 Φ[-ACC] ga53 ma21 za53 te31 Lahu
1SG soldier be want

I want to be a soldier.
→ ŋa31 ma21za53 te31 ga53

According to Muysken & Veenstra (1995) and Yang (2009), the verbs in SVCs have the following features: 1) they share the same subject; 2) they have at most one direct object[5]; 3 tense/aspect markers adjoin to V1 or V2; 4) there is only one negative particle; 5) there is no coordinate or subordinate conjunction; 6) there is no pause; 7) the higher constituent in the syntactic hierarchy governs the lower constituent in the syntactic hierarchy. V1's object, O1, is more prominent than V2's object, O2. Thus O1 can bind O2 asymmetrically. In syntax VP1's projection is higher than that of VP2, and VP2 is embedded in VP1, as shown in 15 (a). If V1 is a transitive verb, SVCs are similar to intransitive constructions, as shown in (15b). (cf. Dechaine 1988; Johnson 2000).

15 (a) [IP[I' [VP1[VP1][VP2]]]]
(b) [IP[I' [VP1[V1][VP2]]]]

Li & Thompson (1981) analyze VP1 as an adverbial phrase, which adjoins to and modifies VP2, as shown in (16):

(16) [IP Subji[VP[Adjunct clause proi VP1]VP2]]

In this case, the Chinese SVC *ta gui xialai qiu wo* is analyzed as in (17):

(17) [IP ta i[VP[Adjunct clause proi gui xialai]qiu wo]]
3SG kneel down beg 1SG

He begged me kneeling down. Paul (2004) argues that SVCs can be analyzed not only as an adjunct structure, but also as a purposive clause structure, as shown in (18):

(18) [IP Subji[VPVP1][Purposive clause proi VP2]]

According to (18), the Chinese SVC *ta da dianhua jiaoche* have two possible analyses, as shown in (19):

19 (a) [IP ta i[VP[Adjunct clause proi da dianhua] jiao che]] (adjunct)
3SG beat phone call car
He phoned to call a taxi.

[5] Only the first verb takes an overtly realized direct object. The unrealized object of the second verb is understood to be coreferenced with the object of the first verb (cf. Müller & Lipenkova, 2009).

(b) [IP ta i[VP da dianhua][Purposive clause proi jiao che]] (purposive clause)
3SG beat phone call car
He phoned to call a taxi.
Hence the internal structure of SVCs can be analyzed as follows:

20 VP1 VP2
Adjunct major predicate
Major predicate purposive clause

(VP2's covert subject pro is controlled by the matrix subject. Li & Thompson (1981) point out that an SVC may be understood to be related in one or more of the following four ways: 1) consecutive; 2) purpose; 3) alternating; 4) circumstance. VP1 modifies VP2 and they express a single event instead of two separate events. The previous works by Déchaine (1986), Foley & Olson (1985) Baker (1989) and Collins (1997:46) point out that V1 and V2 share the same internal argument instead of the same object.

21 (a) Wo da fufu du Ewe
3PL cook fufu eat
They cooked fufu and ate it.

(b) Me nya devi-e dzo Ewe
1SG chase child leave
I chased the child away.

In 17 (a) *fufu* is the common object of V1 *da* and V2 *du*. In 18 (b) *devi* is the object of V1 *nya* and the unique argument of V2 *dzo*. According to (6), the internal structure of 21 (a) is as follows: (22) [vP Wo[v` cook[VP1 fufui[V1` tcook [VP2 proi[V2` du]]]]]] In (22) V1 takes VP2 as its complement and the covert internal argument of V2 is co-referential with that of V1. More precisely, the object of V1 controls the empty category in the Spec position of VP2. In other words, VP2 is analyzed as a kind of secondary predication. V raises to the light verb v and merges with it. Since V1 and V2 share the same argument, V2 cannot be followed by an overt NP. If V2 is followed by an overt NP, the construction is ungrammatical, as illustrated in (23):

23 Wo-a da fufu du-(*i) Ewe
3PL-FUT cook fufu eat 3SG

They will cook *fufu* and eat it. Whereas in the SVC in Ewe the future is marked only on V1, in a coordinate structure it must appear in front of each verb (Collins, 1997):

(24) (a) Me fo kadɛgbɛ gba
1SG hit lamp break
I hit the lamp and broke it.

(b) Me a fo kadɛgbɛ gba
1SG FUT hit lamp break
I will hit the lamp and break it.

(c) Me a fo kadɛgbɛ *(a) gba (yɛme) tsimini
1SG FUT hit lamp FUT break 3SG-GEN glass
I will hit the lamp and break its glass.

The constructions in 24 (a) and 24 (b) are SVCs but the construction in 24 (a) is a coordinate construction. In 24 (c) the future is marked on V1 and V2, which do not share the same argument. This testifies our hypothesis that V1 can bear an aspect marker and its maximal projection is vP, whereas V2 cannot bear any aspect marker and its maximal projection is VP. Hence V1 and V2 have different syntactic status. Baker & Stewart (2002) argue that there are three types of SVCs, viz. object sharing SVCs, resultative SVCs, and purposive SVCs. In SVCs in Yorùbá, mood/tense is marked on the verb. Likewise, the Misumalpan languages Miskito and Sumu display a rather rich inflectional morphology: the verb is not only marked for tense and person, but also for proximate (same subject) vs. obviative (different subject) (cf. Stahlke, 1970; Hale, 1991) Den Dikken & Sybesma (1998) argue that an SVC can spell out the v-V combination as one single lexical element, whereas a non-SVC cannot. In the combination V1NPV2, if V1 does not assign NP a theta-role, the construction is not an SVC but a pivotal construction.

25 (a) [VP[V gan][SC[NP Zhangsan][X zou]]] Chinese
expel Zhangsan leave
chase Zhangsan away

(b) [vP[v` ba][FP Zhangsan i[F` F ASP[VP gan [SC[NP ti][X zou]]]]]] Chinese
BA Zhangsan expel leave
chase Zhangsan away

The "dummy" element *ba* is inserted into v and the NP raises to [Spec FP] between v and V. The verb does not raise to v and v is therefore lexicalised by an independent morpheme. The positioning of the object depends on the nature of the object NP involved ([+ definite] etc.), as illustrated in (26):

26 (a) ta[VP song-le[VP1 yige xiangzi t song[VP2 pro lai]]] Chinese
3SG send-PST one-CLASS suitcase come
He sent a suitcase over here.

(b) ta[VP song-le[VP1 yige xiangzi i[V1` tsong [VP2 proi lai]]]] Chinese
3SG send-PST one-CLASS suitcase come
He sent a suitcase over here.

(c) ta[vP v songlai-le[VP1 yige xiangzi i [V1` tsong[VP2 proi t lai]]]] Chinese

3SG send-come-PST one-CLASS suitcase
He sent a suitcase over here.

(d) The Internal Structure of SVCs

The generation of SVCs undergoes the following syntactic movement operation: The conjunction between VP1 and VP2 is deleted, which results in left peripheral deletion of VP2. VP2's subject occurs as pro and is co-referential with and controlled by the subject of VP1. In the meanwhile, VP1's subject and object as well as V2 move across the board. VP2's subject moves to the Spec position of VP1 and merges with the Spec. VP2's object moves to the position [Spec VP], and V2 moves to the position [V V`]. VP1 and VP2 share the same subject, whereas VP2's subject occurs as pro and occupies the position [Spec VP2]. VP1's subject moves to the Spec of IP and functions as the common subject of VP1 and VP2. The prerequisite to VP2's movement is that O1 must be null, whereas the prerequisite to V2's movement is that O2 moves.

Due to left peripheral deletion, IP2 is demoted to VP2, as a consequence of which it loses its tense/aspect marker and lies in a secondary predicate position. The semantic weight transfers to VP1, within which V1 moves to the major predicate position. VP1's subject moves to [Spec IP] and c-commands VP1 and VP2. In the meanwhile, left peripheral deletion causes the overt NP in front of VP2 to function as the internal argument of VP2 and the external argument, occurring as pro, is controlled by NP1, the Spec of IP. VP1's subject and VP2's subject are generated

inside themselves and then move to their Spec positions respectively. Since VP1 c-commands VP2 and VP1's subject moves to the Spec position of IP overtly, VP2's subject occurs as pro controlled by 10 VP1. If VP2's subject occurs overtly, the construction is ungrammatical whether VP2's subject co-refers with IP's Spec or not. A simplex sentence can contain only one subject. If VP2's subject and IP's Spec do not co-refer, the overt occurrence of VP2's subject violates the requirement. If VP2's subject and IP's Spec co-refer, VP2's subject cannot occur overtly. In other words, VP2 does not qualify as an independent IP or SC (small clause). The overt NP in front of it can only function as an internal argument instead of an external argument. In this way we can provide a reasonable account of generation of the constructions SV1O1O2V2 and SV1OV2. The overt NP in front of VP2 is the shared object of V1 and V2. If V2 is transitive, it governs NP directly. If it is intransitive, it is causative and governs NP indirectly. NP functions as the shared internal argument of V1 and V2 (Yang 2009).

27 (a) woi zhuazhu shuzhi proi pashangqu Chinese
1SG grasp branch climb-up
I grasped the branch to climb it.

(b) *wo zhuazhu shuzhi wo pashangqu Chinese
1SG grasp branch 1SG climb-up.

As 27 (a) shows, VP2's subject occurs as pro, and V1 and V2 share the object *shuzhi*. As (27b) shows, VP2's subject occurs as an overt NP and V1 and V2 share the object *shuzhi*, as a consequence of which the construction is ungrammatical. It follows that external argument sharing is the obligatory requirement for the existence of SVCs, whereas internal argument sharing is the optional requirement for the existence of SVCs.

Baker (1989) argues that if V1 of an SVC takes an object, then V2 must theta-mark this object as well. An argument can receive more than one theta-role as long as all its theta-roles are assigned to the same structural position. Therefore, one crucial element in SVCs is that V2 must be able to assign a theta-role to an NP, and that the NP is in the object position for V1 and V2. Thus V2 can be followed by no object because it cannot assign two internal theta-roles. The relation between V1 and V2 is determined by the temporal order of the two events they

represent. In other words, verbs in SVCs follow the Temporal Iconicity[6] (cf. Wang, 2007; Yang, 2009).

(28) [S Kofi [I Φ[VP[V` naki Amba[V` kiri]]]]]
Kofi beat Amba kill
Kofi beat and killed Amba.

Chang (1990) proposes two constraints on SVCs, viz. PTS (Principle of Temporal Sequence)[7] and shared reference.

29 (a) wo zhong cai mai
1SG plant vegetable sell

(b) wo meitian zhong cai mai
1SG every-day plant vegetable sell
I plant vegetables to sell every day

(c) *wo zhong cai meitian mai
1SG plant vegetable every-day sell

Adverbial modifiers can occur in front of VP1, whereas no adverbial modifier can appear in front of VP2. Hence 29 (c) is ungrammatical. The generation of 29 (a) is shown as in (30):

（30）[VP mai cai]
→[TP__[mai cai]]
→[TP wo[VP mai cai]]
→[V` zhong[TP wo[VP mai cai]]]
→[VP wo i[V` zhong[TP ti[VP mai cai]]]]
→[VP cai[V` zhong[VP wo i [V` tzhong [VP mai tcai]]]]]
→[TP wo i[T`zhong[VP cai[V` tzhong[VP ti[VP mai tcai]]]]]]

[6] Yang (2009) argues that there is no mutual c-command but asymmetrical c-command between V1 and V2, which can guarantee that V1 is superior to V2 syntactically and prior to V2 linearly. It can be inferred that V1 c-commands V2 asymmetrically, but not vice versa.

[7] The interpretation that an event depends on the event preceding it is based on our understanding of the real world, in which ends unfold along a time dimension. (Chang, 1990). According to the temporal iconicity assumption, language comprehenders exploit the linearity of discourse when building their representations of temporal aspects of the situation (Chafe, 1979; Comrie, 1985; Dowty, 1986; Givón, 1992; Hopper, 1979). By default, readers assume that the order of verbs corresponds to the hronological order of the actions or events in the situation referred to, so that successive verbs describe successive actions or events (de Vega *et al,* 2004).

31 (a) wo dao-le sanbei shui he-le Φ Chinese
1SG pour-PST three-CLASS water drink-PST
I poured three glasses of water to drink.

(b) wo dao-le sanbei shui he-le yibei *e* Chinese
1SG pour-PST three-CLASS water drink-PST one-CLASS REF
I poured three glasses of water and drank one of them.

As (31) shows, V1 and V2 in the SVC share NP *shui*, whereas V1 and V2 in the non-SVC do not share the whole NP but only the head noun *shui*, excluding the classifier *bei*, for *bei* carries the referential meaning. Chang (1990) argues that the verbs of an SVC hold a temporal dependency relation and share a common NP. The shared common NP denotes a shared reference. Thus SVCs undergo the deletion of a redundant NP2, which follows V2, for the sake of economy. The thematic structure (PTS) is mapped into the functional structure (shared reference), which is different from Baker's approach that the constituent structure is mapped from the constituent structure to the thematic structure: double-heads are designed to meet the needs of theories rather than to describe and explain language in real use. (cf. Wang, 2007) V2 modifies V1 and functions as V1's purpose. V1 is higher than V2 in the syntactic hierarchy. The difference between V1 and V2 lies in their linear order and related semantic relationship (cf. Yang, 2009). Furthermore, the relationship of the two verbs is subordinate. The two events indicated by VPs are sequential and serial.

32 (a) wo zhong cai mai-le Φ Chinese
1SG plant vegetable sell-PST
I planted vegetables and sold them.

(b) wo mai shu kan-le Φ Chinese
1SG buy book read-PST
I bought a book to read.

Quantifier Floating and VP-Internal Subject Hypothesis can testify that VP2 in the SVC is not IP2. A quantifier is base-generated as part of the subject DP. After the subject raises from [Spec VP] to [Spec IP], the quantifier can remain in situ. In the SVC, however, IP2's subject cannot remain in situ if it contains the subject (cf. Sportiche 1988; Koopman & Sportiche, 1991; McCloskey, 1997). NP in the QP (quantifier phrase) is constrained syntactically, i.e. the semantic property of the NP object must be licensed. O1 and O2 have the same semantic reference and value.

O1's semantic reference property determines O2's semantic reference property. If the former is definite, the latter is definite. If the former is indefinite, the latter is indefinite. It follows that O2's syntactic-semantic features must be licensed by O1. If the QP functioning as the internal 12 argument of V2 fails to be licensed by syntax, the construction would be ungrammatical. O1 can be indefinite, but O2 must be definite. If O2 occurs as a full NP, the construction would be ungrammatical. According to Li (2005), if there is coordination between two clauses, the predicate VP of the second clause can be deleted. Coordination, however, is a necessary condition.

33 (a) John will be there; Bill will [be there], too.

(b) John will be there; Bill will [ ], too.

These are instances of phonological representation deletion. In this case, deletion is optional. Hence (33a) and (33b) are both grammatical. In (33b) the optional null constituent does not require an antecedent; deletion is applied without antecedents (cf. Hankamer & Sag, 1976).

According to Kayne (1994) and Nunes (1995), deletion is applied due to linearization. The form of the empty category in elliptical structures is base-generation of the null form. Only the constituent chosen by the head can occur in the null form. The null category in elliptical structures occurs for the purpose of satisfying the selection property of the head. The selection of the empty category is subject to the following constraints: 1) if the head takes the empty category E as its complement, E must project; 2) E can be generated in the null form (no lexical form) only when it is selected by the head. This shows that the empty constituent projects for the mere purpose of satisfying the selection constraint of the head. A transitive verb requires an object. If the verb is followed by no overt object, the object is null. In this way the selection constraint is satisfied. Only the selected constituent can project, viz. the missing constituent in VP can be the object of the transitive verb (Li, 2005). When the verb is ditransitive, its sub-categorization feature requires its two objects to occur simultaneously. In this case the missing constituents are two objects.

The null object in Chinese does not occur overtly, viz. there is no lexical item to bear accusative Case. Like other languages with overt morphological case markers, NP in Chinese is assigned Case. The assignment of Case is in conformity with Visibility Conditions and Theta Criterion (Travis, 1984; Koopman, 1984; Li, 1985, 1990). The empty constituent occurs in the argument position (Saito, 1985). It needs to be licensed by the formal features of a specific head. Therefore it must

be Case marked (cf. Lobeck, 1995, 1999; Li, 2005). In the case of Case assignment, Case must be realized by an overt constituent. In the case of non-Case assignment, an empty constituent cannot occur. If a verb takes a noun as its object, the object may be null. If a verb is transitive and its subcategorization features require that a noun function as its object, it must merge with e with the category feature [+N].
(34) [VP V e DP]

Deletion takes place in the chain which is formed due to movement. But head ellipsis does not take place because a head which selects a complement cannot be generated in the null form (Li, 2005). In terms of S+V1+V2, V2 denotes purpose, its subject occurring as pro. V1's object can be definite or indefinite. On the contrary, V2's object must be definite, and its valuation depends upon V1's object. In this way, the operator-variable relation between the two objects is formed. In view of technology, V2's object is actually an empty operator, which moves to [Spec CP] and leaves a variable in the object position.

(35) Si V1 O proi V2 variable

The variable must be licensed by the operator O, and the variable and the operator are co-referential, as illustrated in (36):

36 (a) Zhangsani mai yige baozi j proi chi Φj Chinese
Zhangsan buy one-CLASS steamed-stuffed-bun eat
Zhangsan bought a steamed stuffed bun to eat.

(b) Zhangsan gei Lisii yizhi yan j proi chou Φj Chinese
Zhangsan give Lisi one-CLASS cigarette smoke
Zhangsan gave Lisi a cigarette to smoke.

(c) Zhangsani ba luobo j proi mai Φj Chinese
Zhangsan pull turnip sell
Zhangsan pulled the turnip to sell.

(d) Zhangsani ba dingzi j proi yong Φj Chinese
Zhangsan pull nail use
Zhangsan pulled the nail to use.

The projection of the null constituent is to satisfy the selection constraint on the head. The transitive verb requires an object. When the transitive verb is followed by no overt NP, it projects a null object. In this way the selection constraint is satisfied. Only the constituent that are selected can project. Therefore, the missing constituent in the VP must be the object of the transitive verb. (Li, 2005) The null

numeral must be licensed. If O2 or the null constituent marked with Case can be a condition on licensing the null numeral, it can be inferred that the grammaticality of the indefinite QP is relevant to the occurrence of O2. In general, SVCs with O2 as the shared object can license QP.

5.0 Conclusion

This paper is mainly concerned with left peripheral deletion; object gapping and the internal structure of SVCs. SVCs arise from the deletion of conjunctions between two clauses and left peripheral deletion. Left peripheral deletion triggers the movement of VP1's Spec to the position of IP's Spec and the occurrence of VP2's Spec as pro, as a result of which VP1 asymmetrically c-commands VP2. Object gapping triggers the ATB movement of VP2 to generate various types of SVCs. It is argued that the differences between coordinative constructions, pivotal constructions and SVCs lie in their internal structure but not in the verb position.

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