

## Is UG Like a Chunk of Swiss Cheese? Evidence for a “Third-factor Principle”\*

Yafei Li<sup>1,2</sup> and Jen Ting<sup>3</sup>

*Nanjing University*<sup>1</sup>

*University of Wisconsin-Madison*<sup>2</sup>

*National Taiwan Normal University*<sup>3</sup>

The word order of the serial verb constructions provides evidence for a “third-factor principle” at work. While what we know about UG linearizes syntactic constituents on the basis of hierarchical structure, serial verbs are linearized in accordance with iconicity, with the same semantic relation mapping to a constant word order but to varying structural relations. The utilization of iconic linearization under strict conditions may be viewed as a case of general cognitive mechanisms at work when UG has a functional gap for sentence-generation.

Key words: serial verb construction, third-factor principle, linear iconicity, UG

### 1. Introduction

UG has been said to be (the theory of) the initial state of the faculty of language (FL). Thus defined, the notion is extremely difficult for linguists to investigate because no data can be obtained directly from this “initial state”. In practice, therefore, UG is taken to be the general principles and parameters that jointly generate all the phrasal structures S up till the sentence-level. S encodes all the necessary information for the LF and PF interfaces to “interpret” into, respectively, the conceptual-intentional and the articulatory-perceptual systems of human cognition. Put differently, UG is fully capable of both deterministically generating the hierarchical structure at the sentence level and parametrically linearizing all the constituents in the structure.

With the recent development of the Minimalist Program (MP), it has been explicitly recognized that “development of language in the individual must involve

---

\* An earlier version of this article was presented at the 13<sup>th</sup> International Symposium on Chinese Languages and Linguistics (IsCLL-13), National Taiwan Normal University, Taiwan, 2012. We are grateful to the audience for helpful comments. We also wish to acknowledge the anonymous *Language and Linguistics* reviewers for their constructive comments. Mistakes are exclusively our own.

three factors: 1) genetic endowment ...; 2) external data ...; 3) principles not specific to FL” (Chomsky 2007:4). With this recognition comes the new task for linguists: “How little can be attributed to UG while still accounting for the variety of I-languages attained, relying on third-factor principles?” (Ibid: 5). The current paper aims to identify one such third-factor principle.

Specifically, provided that UG is represented in the Principles-and-Parameters (PnP) model, it is shown to be not fully responsible for the grammatical behaviors of the serial verb constructions<sup>1</sup> (SVCs) once the latter are closely examined in the cross-linguistic context. In this sense, UG has functional gaps, not previously recognized, that are much like what is inside a chunk of Swiss cheese:

(1) A cheesy view of UG



The entire chunk is comparable to the collection of all the grammatical (i.e., structural and linear) traits up till the sentence level. The solid content corresponds to what UG can do. The pockets are part of the chunk and thus in this analogy are representative of a portion of the sentence-level grammatical properties. But they are not the outcome of UG. What fills a pocket is a third-factor principle “not specific to FL”.

Two quick clarifications. First, exactly how many pockets of this type exist in order to yield the sentences of all human languages is an empirical question. This paper is concerned only with one such case, bearing on the linear and structural properties of the SVCs. Secondly, echoing Chomsky’s minimalist view of UG, this paper may be interpreted as helping define the boundaries of the PnP model by distinguishing its characteristics from those of a possible third-factor principle.

---

<sup>1</sup> We refer the reader to the immense literature on SVCs for their definitions and some remaining issues.

## 2. Between the linear order and the syntactic structures of the SVCs<sup>2</sup>

That the linear order between the two verbs in a SVC remains constant and reflective of the temporal sequence in which the corresponding events take place is an observation made explicitly by functionalists (e.g., Tai 1985) and somewhat indirectly by formalists (e.g., Muysken 1987). In this paper, the phenomenon is descriptively called linear iconicity (LI), borrowed from functionalist literature. Within the PnP model, LI has received highly diverse treatments, ranging from fully recognizing it as an axiomatic principle (Li 1993) to totally denying it (Newmeyer 1998, 2004). There are casual or last-resort references to the fact (Collins 1997, Hiraiwa & Bodomo 2008); efforts are also made to derive part of it from UG and dismiss the rest through counterexamples (Baker 1989, Carstens 2002). It is beyond the scope of this paper to assess all the analyses out there. Instead, this section will focus on making the following point:

- (2) While SVCs are known to conform to LI in word order, there does not exist a uniform structure between the verbal projections.

It follows that the word order cannot be derived exclusively from the hierarchical structure underneath it. The theoretical implications of (2) with respect to UG will be addressed in §3. And to the extent that (2) is empirically substantiated, it also constitutes an argument against the published attempts to reduce LI to UG (which, as was noted above, is embodied by the PnP model).

### 2.1 Instrumental SVCs: One word order for multiple structural arrangements

Compare the following extractability variations from Sranan and Chinese. To help subsequent discussion, the first verb from the left is referred to as V1 and the second, V2:

- (3) Sranan (Jansen, Koopman & Muysken 1978, JKM)
- a. San Kofi teki koti a brede?  
    what Kofi take cut the bread  
    ‘What did Kofi cut the bread with?’
  - b.(\*)San Kofi teki a nefe koti?  
    what Kofi take the knife cut  
    ‘What did Kofi cut with the knife?’

---

<sup>2</sup> The content of this section is based on §2.2 of Li & Ting (2011).

(4) Chinese

- a. Taotao na/yong zheba dao qie nakuair dangao.  
 Taotao take/use this knife cut that.piece cake  
 ‘Taotao cut that piece of cake with this knife.’
- b. Nakuair dangao, Taotao na/yong zheba dao qie.  
 that.piece cake Taotao take/use that knife cut  
 ‘That piece of cake, Taotao cut with this knife.’
- c. \*Zheba dao, Taotao na/yong qie nakuair dangao.<sup>3</sup>  
 this knife Taotao take/use cut that.piece cake  
 Intended reading: ‘This knife, Taotao cut that piece of cake with.’

In Sranan, the object of V1 is always extractable whereas that of V2 can be moved only for some speakers. Chinese reverses the pattern, with topicalization applying to the object of V2 only.

In the PnP framework, the patterns in (3)-(4) have the standard island analysis: V1 is the matrix verb in Sranan and VP2 is taken to be the complement of V1 for some speakers and an adjunct for others. In Chinese, V2 is the matrix verb whereas VP1 is used as an adjunct. But among all these inter- and intra-language variations in syntactic structure, the linear arrangement of the verbs remains unchanged and compliant with LI: getting hold of the knife necessarily precedes the cutting with it; and *take* always precedes *cut*. These examples provide the first piece of evidence for (2).

The island-based account of (3)-(4) is substantiated with independent evidence from these languages. Consider the Sranan example in (5), also from JKM:

- (5) Mi e koti a brede nanga a nefi.  
 I ASP cut the bread with the knife  
 ‘I cut the bread with the knife.’

---

<sup>3</sup> A reviewer pointed out that “(4c) becomes well-formed once the morpheme *lai* is inserted between *na/yong* and *qie*”. We agree. With *lai* in place, restoring the topicalized NP to its D-structure position yields (i) below:

- (i) Taotao na/yong zheba dao lai qie nakuair dangao.  
 Taotao take/use this knife LAI cut that.piece cake  
 ‘Taotao used this knife to cut that piece of cake.’

The second VP of the example now acquires the detectable flavor of expressing the purpose of knife-taking. A possibility is that *lai*, originally meaning ‘come’ but semantically bleached when used this way, functions as a complementizer. It would follow then that (i) is no longer a serial verb construction. Instead, V1 is now the matrix verb taking a postverbal CP. The fact that the object of V1 can be topicalized is now expected. See §3 for the role of complementizers in UG’s linearization algorithm.

The instrumental PP is postverbal, proving that adjuncts indeed adjoin to the right in Sranan and therefore it is legitimate to treat VP2 in (3b) as an adjunct for the matrix V1.

Turning to Chinese, a comparison between the instrumental SVC in (4) and the similar-looking causative in (6) confirms that VP1 in the former is an adjunct:

- (6) a. Ni bugai rang zhexie zhongxuesheng zuo daxue de ti.  
 you shouldn't let these middle.schooler do college DE problem.set  
 'You shouldn't let these middle school students do college-level problems.'
- b. Zhexie zhongxuesheng ni bugai rang zuo daxue de ti.  
 these middle.schooler you shouldn't let do college DE problem.set  
 'These middle school students, you shouldn't let do college-level problems.'

In colloquial speech, topicalizing the NP after the causative verb *rang* 'let, make', as in (6b), is allowed. This is expected because *rang* 'let' is the matrix verb and the NP following it is either the matrix object or an ECM subject, both of which are known to be extractable. In contrast, the NP after *na* 'take' in (4c) rejects movement, so *na* 'take' must be heading an adjunct and NOT functioning as the matrix V.

Binding in these constructions provides further evidence. The examples below use Binding Condition C (BCC); See Li & Ting (2011) for more examples with other binding conditions:

- (7) a. \*Wo dasuan rang Xue Pan<sub>i</sub> xiahu zhege wangbadan<sub>i</sub> de  
 I intend let X.P. intimidate this SOB DE  
 chouren.  
 personal.enemy  
 '\*I'm planning to let XP<sub>i</sub> intimidate this SOB<sub>i</sub>'s enemies.'
- b. (?)Wo dasuan na/yong Xue Pan<sub>i</sub> xiahu zhege wangbadan<sub>i</sub> de  
 I intend take/use X.P. intimidate this SOB DE  
 chouren.  
 personal.enemy  
 'I'm planning to make use of XP<sub>i</sub> and intimate this SOB<sub>i</sub>'s enemies.'

*Zhege wangbadan* 'this son of a bitch' is an epithet which is known to obey BCC. The unacceptability of (7a) results from the epithet c-commanded by the antecedent *X.P.* because the causative verb is the matrix V. As (7b) allows the intended coindexation, it must be concluded that *X.P.* does not c-command the epithet, which in turn indicates that V1 *na* 'take' is not the matrix verb but heads an adjunct instead.

In summary, an instrumental SVC displays the same word order cross-linguistically while V1 and V2 can be in any of the possible structural relations (head-complement, head-adjunct, adjunct head), directly in support of (2).

## 2.2 Predicate cleft out of SVCs: How much of it is allowed in a language?

Shown below is predicate cleft (PC) in the SVC of the African language Dàgáárè:

- (8) a. o da sɛ la nene ɔɔ. (Hiraiwa & Bodomo 2008: ex.(26))  
 3SG PAST roast FOC meat eat  
 ‘He roasted meat and eat it.’
- b. seɔ la ka o sɛ nene ɔɔ.  
 roast.NML FOC C 3SG roast meat eat  
 ‘It is roasting that he did and ate meat.’
- c. ɔɔ la ka o sɛ nene ɔɔ.  
 eat.NML FOC C 3SG roast meat eat  
 ‘It is eating that he roasted and did to meat.’
- d. se-ɔɔ la ka o da sɛ nene ɔɔ.  
 roast-eat.NML FOC C 3SG PAST roast meat eat  
 ‘It is roasting and eating that he did to meat.’

With independent evidence that PC can be long-distance but sensitive to islands, Hiraiwa & Bodomo conclude that it is derived through movement. (8a) is the default form of a consecutive SVC. PC applies to V1 in (8b), to V2 in (8c), and to both verbs in (8d). See Hiraiwa & Bodomo for the structural details of the analysis, especially the “3D” structure to permit the simultaneous cleft of V1+V2.

What is significant for this paper is the comparison made by Hiraiwa & Bodomo about the languages related to Dàgáárè. In brief, while all the languages considered allow PC for V1, they vary greatly in applying the operation to V2 and V1+V2:

### (9) Cross-linguistic variations of PCs in SVCs

	Buli	Yoruba	Edo	Nupe	Fongbe	Dàgáárè
V1	Yes	Yes	Yes	Yes	Yes	Yes
V2	No	No	Yes	No	Yes	Yes
V1+V2	Yes	Yes	No	(No)	No	Yes

As long as PC results from syntactic movement, all other languages in this chart take V1 to be the matrix verb (hence subject to PC) while giving the projection of V2 a

structural treatment somewhat different from Dàgáárè so as to produce the variations. Hence (2) is further substantiated: The linear order of the verbs in an SVC remains LI-compliant but the structural relations between them vary from language to language.

### 2.3 Resultative compounds: Only two morphemes but different head locations

East Asian languages all have resultative compounds composed of V1 for the cause event and V2 for the result. But Li (1993) notices a parametric difference among them. The examples below are from Chinese and Japanese, though Korean patterns exactly with the latter:

- (10) Chinese  
 Youyou da-si-le Taotao.  
 Youyou beat-die-ASP Taotao  
 ‘Youyou beat Taotao and as a result Taotao died.’
- (11) Japanese  
 a. \*John-ga Mary-o naguri-shinu-ta.  
 John-NOM Mary-ACC hit-die-PAST  
 Intended reading: Comparable to (10).  
 b. John-ga Mary-o naguri-korosu-ta.  
 John-NOM Mary-ACC hit-kill-PAST  
 ‘John hit Mary and as a result killed her.’

Whereas the intransitive *si* ‘die’ is used as V2 in Chinese, its causative counterpart *korosu* ‘kill’ is required in Japanese. Corresponding to this contrast is the different locations of the morphological heads in the two languages. Chinese resultative compounds are head-initial (as is Chinese VP — cf. Li 1990) while their Japanese counterparts are head-final (as is Japanese VP). Provided that a compound C must inherit the basic lexical properties of its head H (Di Sciullo & Williams 1987), the thematic subject of C must also be the thematic subject of H. In Chinese, V1 *da* ‘hit’ is H and the subject of the entire clause must be the “hitter”. The fact that this subject is not thematically associated with V2 *si* ‘die’ is permitted grammatically. In Japanese, V2 is the head of the compound and therefore must contribute thematically to the subject of the clause. The only way to accomplish this while still letting the object refer to the dead party is to turn *die* into *kill*. See Li (1993) for other related behavioral differences among these languages that are explained through this analysis.

That the transitivity variations of V2 in East Asian resultative compounds supports (2) is straightforward. First, the linear order of V1 and V2 is constant and compliant with LI, with V1 denoting the cause and V2 the effect. This fact can be better appreciated with a question: Why wouldn't Japanese and Korean swap the order of the two morphemes so as to have *die-hit*? It would be the exact mirror image of Chinese in a head-final language and thus would be grammatically well-formed just as in Chinese. The fact that no such reversed order is found with resultative constructions composed of two verbal components even in head-final languages, is unlikely to be accidental and should not be dismissed simply because UG has no vocabulary or apparatus to handle it.

Secondly, while the linear order of the verbal morphemes stays cross-linguistically the same, the structural relation between them varies from one language to the other. Despite the fact that morphological structure involved here is perhaps nothing more than concatenating two morphemes, either V1 or V2 may serve as the morphological head depending on the particular UG setting of the given language. In sum, this is also the same-order-varying-structure phenomenon (2) describes, and apparently, (2) holds in syntax and morphology alike.

A reviewer brought up German resultatives as examples “violating LI”:

- (12) a. Sie haben ihn tot geschossen. (Kratzer 2004)  
they have him dead shot  
'They shot him dead.'
- b. Sie habe ihn er-schossen.  
they have him dead-shot  
'They shot him dead.'

As Li (1993) already noted, a necessary condition for LI in the SVC context is that LI holds only among verbal projections. If one of the predicates is not verbal, the linear order obeys the parametric setting of the particular language in question. Since neither *tot* 'dead' in (12a) nor the prefix *er-* 'dead' in (12b) are analyzed as verbal, they are expected to precede the verb (or the verbal root) as German verbal structures are typically head-final. See Li & Ting (2011) for more examples from multiple languages that support this generalization, which clearly bears on the final characterization of LI but is beyond the immediate concern of the current work.

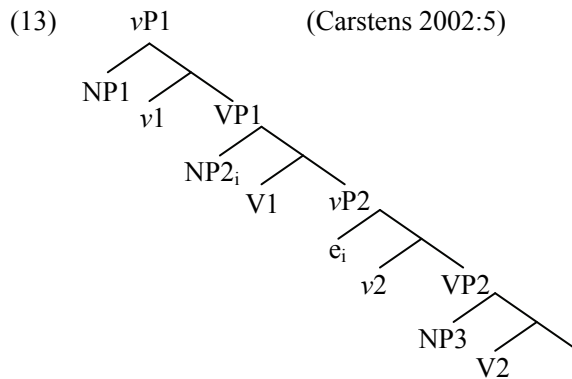
## 2.4 Even a uniform analysis of SVCs ends up supporting non-uniform structures

In the UG-based literature on the SVCs, one may observe the obvious default assumption that there exists a uniform structural description for them all. See Baker



(1989) and Carstens (2002) for the representatives of this mainstream approach.<sup>4</sup> Interestingly and somewhat ironically, the existing uniform analyses actually provide an argument against assigning the same structure to all SVCs and thus end up supporting (2). We use Carstens' work for illustration.

Her structure for the instrumental SVC in Sranan and Ijo is given in (13), with the corresponding examples in (14a-b):



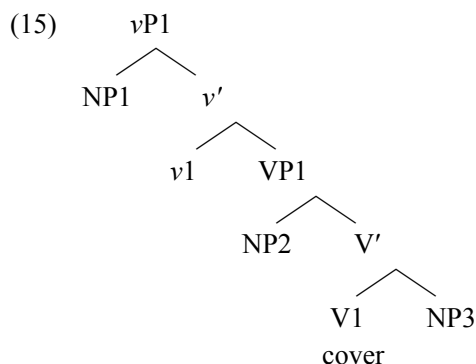
- (14) a. Sranan (Muysken 1987)  
 No teki baskita tyari watra.  
 no take basket carry water  
 'Don't carry water with a basket.'
- b. Ijo (Williamson 1965)  
 Áràú zu-ye ákì buru teri-mí.  
 she asket take yam cover-PAST  
 'She covered yams with a basket.'

With the verbs *in situ*, the structure directly yields the head-final word order in (14b). If the verbs are raised to the corresponding  $v$  positions, the head-initial (14a) is derived. Carstens' conclusion: Kayne's (1994) universal head-initial structure (implemented through the non-Kaynean  $v$ -V system) is sufficient to derive the superficially different head-locations inside VPs despite the same linear arrangement between V1 and V2. The same structural setup is given to other types of SVCs too, with variations only inside  $vP2$ .

There is robust proof that Carstens' argumentation is flawed in multiple ways (cf. Li & Ting 2011). For the purpose of the current paper, however, we will take (13) as is

<sup>4</sup> By uniform structure we mean the structural relation between the two verbal projections. Depending on the transitivity of specific verbs, the internal structure of each verbal projection naturally varies, but this level of variation is irrelevant to the current discussion.

and explore its logical consequences. To begin with, an advantage of (13) should be noted which is not mentioned by Carstens: As long as  $vP2$  is the complement V1 and V2 is (in effect) taken to have three arguments (the Theme NP3, the Instrument  $e$  and the Agent which is missing in the tree with no explanation), the structure is potentially capable of enforcing the so-called LI word order. Suppose the two lexical verbs in (14b), *take* and *cover*, to be swapped, namely with *cover* as V1 and *take* as V2. The structure for the  $vP1$ -VP1 suite would be (15):



where NP1 is Agent and NP2, NP3 are Instrument and Theme, respectively. But with the three arguments of *cover* filling all the Spec and complement positions in  $vP1$ , there is no place to put  $vP2$  any longer. That is, the only way to place one lexical verb's projection in the complement position of the other lexical verb is to treat the two-argument *take* as the matrix verb and the three-argument *cover* as heading the complement of *take*. As long as the structure strictly follows Kayne's theory, this effectively forces *take* to precede *cover*. In this analysis, the unchanging word order in the SVC is not due to LI but the direct result of UG.

Now consider another popular SVC, the consecutive. The examples are Chinese:

- (16) a. Ta kao-le yige dangao chi.  
 3SG bake-ASP a cake eat  
 'S/he baked a cake and ate it.'
- b. Ta gei-le women yige dangao chi.  
 3SG give-ASP 1PL a cake eat  
 'S/he gave us a cake and we ate it.'

Both verbs in (16a) are simple transitives, which means that in Carstens' theory, either verb may serve as the matrix V1 taking  $vP2$  as complement. More generally, because

the two action verbs, *bake* and *eat*, have identical argument structures, UG as we know it has no way to distinguish them either thematically or structurally. Lack of structural distinction translates to the inability to impose a particular linear order. It follows that at a fundamental level, no purely syntactic analysis, be it Carstens' (2002) or Baker's (1989) or anyone's, is adequate for explaining why *bake* must precede *eat* in a consecutive SVC. On the other hand, the word order is LI-compliant because eating the cake necessarily follows baking it.

(16b) poses a different type of problem. V1 is a di-transitive verb, with *ta* '3SG' as Agent, *women* '1PL' as Goal and *yige dangao* 'a cake' as Theme. Now Carstens faces two choices. If we follow the non-Kaynean *v*-V system that she adopts, the complete projection of *gei* 'give', i.e., *v*P1, has only three argument positions as shown in (15), all occupied. This raises the question about the structural position of *v*P2 (headed by *chi* 'eat'). If both *v*P1 and *v*P2 are *in situ*, then *v*P2 can only be a right-adjoined adjunct inside *v*P1. But this means that even if Carstens is right about treating *v*P2 as the complement of V1 for the instrumental SVC, *v*P2 of the consecutive SVC is nonetheless in a different structural relation with V1, a conclusion that directly supports (2). Alternatively, one may follow Kayne by banning any right-side adjunction. To make V2 *eat* appear to the right of V1 *give* in (16b), one would have to generate *eat* initially to the left of *give* and then raise some projection of *give* to a position higher than (and therefore left of) *eat*. This is easy to do technically, but if *give* and its object are generated to the right of *eat*, why do they have to move to the left of *eat* in the first place? In effect, this seems like a restatement of the obligatory LI order through much structural manipulation. That is, it still supports (2).

The other choice for Carstens to handle (16b) is to abandon the *v*-V system and rely on Kayne's original phrase structure, i.e., with no limit to the number of VPs one may have for any given lexical verb. Then even with *give* as V1, one is not restricted to just two phrases (*v*P and VP) and three argument positions — a third VP is always an option which will bring in one more argument position. *Give*'s own arguments use up three such positions, leaving the last one to host *v*P2 (headed by *eat*). While this strategy will accommodate (16b), it unfortunately will equally permit the reversal of *take* and *cover* for the instrumental SVC in (14). This is so because the very ability for Carstens to impose the right linear order in (14) is, as made clear earlier, to limit the argument positions in *v*P1 to three. Removing that limit would immediately permit the claimed three-argument verb *cover* to serve as the matrix verb and thereby wrongly allow the never-observed *cover* preceding *take*.

In summary, a uniform UG-based theory of the SVCs such as Carstens' either fails to yield the correct word order or ends up assigning non-uniform structures to the projections of V1 and V2. In the former case, it is an inadequate theory; in the latter

case, it supports (2). And more importantly, we have seen that it is intrinsic of the PnP model of UG not to be able to distinguish two verbs with identical argument structures. As such, UG as we know it cannot derive the word order of at least some SVCs regardless of the specific implementations that individual authors opt for.

### 3. In terms of theory

With (2) proven to be a valid description of the SVCs, we are ready to consider its implications about UG.

#### 3.1 A clause-internal word order not from UG

First and foremost, (2) means that the word order of the SVCs does not come from UG. It is the general consensus of the field that the core of the human language faculty is composed of these three major components:

- (17) a. A combinatorial algorithm to generate a hierarchical and recursive clausal structure S.
- b. A mapping protocol between S and its phonological manifestation (including linearization).
- c. A mapping protocol between S and its semantic content.

Different authors may vary on details (Chomsky 1995, Culicover & Jackendoff 2005), but there is no major disagreement that the semantic relations among constituents are represented through hierarchical structures which in turn are linearized according to the parametric settings of a given language.

The model in (17), taken to reflect UG, presumes that linearization is a function of the hierarchical structure. For example, a head-initial language determines the linear order of a NP and a V by looking at their structural relation — if NP is the Spec in VP, it precedes V; if it is the complement, it follows V (or V has to raise if one uses Kayne's universal phrase structure). To put aside various details irrelevant at this level of discussion, here's how UG operates:

- (18) a. Identical semantic relations map to identical hierarchical structures under UG principles;
- b. Hierarchical structures linearize according to UG parameters.

To the extent that Baker's (1988) UTAH is valid, it captures a subset of what is described in (18a).

(2) depicts a different scenario. Given the fact that the structural relation between V1 and V2 changes from one language to another and from one type of SVC to another, the type of consistent mapping between semantics and structure in (18a) is broken. With the instrumental SVC, for instance, the same semantic relation between taking a tool and performing an action with it is represented differently both cross-linguistically (V2 = matrix V in Chinese and V1 = matrix V in Sranan) and intra-linguistically (VP2 = complement or adjunct in Sranan). This immediately raises a question: If the semantics-syntax mapping is no longer deterministic, how is the syntactic structure generated anyway? Given the fact that the only constant factor among the SVCs is the LI-compliant word order, (19) best summarizes what happens, using word order as the anchor to come up with the structure:

- (19) a. Identical temporal relations between verbal projections map to identical linear orders.  
 b. The structural relation between verbal projections is determined in accordance with (a) and UG parameter settings.

Logically, (19) is compatible with two scenarios where UG and LI interact. The first is “deterministic”, with (19a) setting the linear order of the verbal projections as the initial step. Then the structural “foot” can be squeezed into the LI “shoe” through the particular parametric settings of the language. To illustrate, consider the instrumental SVCs again. Since getting hold of a tool precedes performing the action with the tool, the temporal relation between [<sub>VP1</sub> take a knife] and [<sub>VP2</sub> cut the bread] (cf. (3)-(4)) requires VP1 to linearly precede VP2. This is (19a), a constant throughout all SVC languages. Within the confines of this word order, the head-location parameter of a particular language comes into play. Chinese VP is head-initial with left-adjoined adjuncts. Hence, treating VP1 as the left-adjoined adjunct to some projection of V2, namely (19b), is the best adjustment of the structural foot to the word order shoe dictated by (19a). Sranan is also head-initial, but its adjuncts are right-adjoined (cf. (5)). With the unchanging *take-before-cut* word order, V1 must be treated as the matrix V. Because both a complement and an adjunct follow the head, VP2 can be either. This is where UG cannot impose a single solution, and the speakers are left with their own pick. Exactly the same interaction between LI and UG happens with other types of SVCs. Take the resultative compounds for example. (19a) requires *hit* to precede the verbal morpheme depicting the result of hitting. *Hit* is the head in Chinese because the language is head-initial for the verb-complement relation and the result predicate in the resultative constructions is typically taken as the complement (Levin & Rappaport Hovav 1995, Ting & Li 1997). Japanese and Korean are strictly head-final, making it necessary

for V2 to be the head and thus producing all the behavioral contrasts covered in §2.3 and in Li (1993).

But (19) also allows for an alternative relation between UG and LI. Let UG generate all the possible structural and linear relations between the projections of V1 and V2 that are allowed in the language, and let (19) function as a filter, picking only the one that complies with LI. In the case of Chinese instrumental SVC, for example, at least two structures will be generated, with the projection of *take* left-adjoined to that of *cut* or vice versa. But only the first one complies with LI and thus is well-formed. Procedurally, this alternative places structure-generation “before” linearization and is therefore more consistent with the general PnP design. Since it also relies on UG not knowing exactly how to handle SVCs (and hence generating all possible V1-V2 combinations), it makes the same argument that UG has a functional gap filled only by a form of iconicity. For these reasons, we are largely neutral toward the two possible scenarios under which (19) operates. One concern with the second scenario is the computational burden it demands — since Sranan allows the postverbal phrase to be either a complement or an adjunct (cf. (3b)), four structural combinations of V1 and V2 must be generated out of which one is picked by LI.

### 3.2 The pocket inside UG

The two linearization protocols, (18) and (19), can be restated as follows. The UG protocol in (18) derives word order on the basis of hierarchical structure whereas the LI protocol in (19) creates (or chooses) hierarchical structure on the basis of word order. Up till now, (18) has been taken as the ONLY way to generate clauses. But we have seen enough evidence that the word order of SVCs results not from (18) but from (19).

It goes without saying that there are conditions under which to activate (19). Li & Ting (2011) has identified several such conditions which, for the purpose of the current paper, are collectively referred to as C. It is under C that the standard UG protocol for linearization — namely (18) — stops working and the LI protocol takes over. This is the pocket suggested at the beginning of the paper.

In essence, UG is not equipped in itself to combine two verbal projections of the kind found with the SVCs. Arguably, UG codes most semantic relations through two means:  $\theta$ -roles and lexicalized relation markers. The former case links lexical heads with arguments (via  $\theta$ -assignment) and adjuncts (via Davidsonian “ $\theta$ -identification” as Higginbotham 1995 puts it); the latter case links constituents (including verbal constituents) with pre/postpositions, complementizers, and other functional items such as *-ing*, *to* and possibly *lai* in Chinese (cf. fn.3). Whenever a semantic relation is expressible thematically or with explicit lexical markers, it is within UG’s jurisdiction.

Through the  $X'$ -schema, such a semantic relation is represented as a hierarchical structure which in turn is linearized through standard UG procedures. But apparently, UG does not know how to express the semantic relation  $R_s$  between two verbal constituents if  $R_s$  is coded neither thematically (such as one verbal projection being an argument of the other) nor through any lexical relation marker. This inability to express  $R_s$  is a functional gap in UG. When it occurs, even the basic clausal structure cannot be assembled unless a third-factor principle “not specific to FL” is activated. From what we can see, this principle is linear iconicity, which draws on the temporal factor in  $R_s$  and linearizes the two verbal projections accordingly. This linearization provides the basis for UG to get back to business because now UG can either utilize the word order-related parameter settings in the language and “reverse-engineer” a hierarchical structure for the verbal projections, or generate a set of structurally legitimate sentences to be filtered by the third-factor linear iconicity. In conclusion, UG as captured in the PnP model is not even equipped to generate all and only good sentences in natural languages; in this sense it may indeed resemble a piece of Swiss cheese, with at least one pocket at its core.

## References

- Baker, Mark C. 1988. *Incorporation: A Theory of Grammatical Function Changing*. Chicago: University of Chicago Press.
- Baker, Mark C. 1989. Object sharing and projection in serial verb construction. *Linguistic Inquiry* 20.4:513-553.
- Carstens, Vicki. 2002. Antisymmetry and word order in serial constructions. *Language* 78.1:3-50.
- Chomsky, Noam. 1995. *The Minimalist Program*. Cambridge: MIT Press.
- Chomsky, Noam. 2007. Approaching UG from below. *Interfaces + Recursion = Language? Chomsky's Minimalism and the View from Syntax-Semantics*, ed. by Uli Sauerland & Hans-Martin Gärtner, 1-29. Berlin & New York: Mouton de Gruyter.
- Collins, Chris. 1997. Argument sharing in serial verb constructions. *Linguistic Inquiry* 28.3:461-497.
- Culicover, Peter W., and Ray S. Jackendoff. 2005. *Simpler Syntax*. New York: Oxford University Press.
- Di Sciullo, Anne-Marie, and Edwin Williams. 1987. *On the Definition of Word*. Cambridge: MIT Press.
- Higginbotham, James. 1995. On semantics. *Linguistic Inquiry* 16.4:547-593.
- Hiraiwa, Ken, and Adams Bodomo. 2008. Object-sharing as symmetric sharing: predicate clefting and serial verbs in Dàgáárè. *Natural Language and Linguistic Theory* 26.4: 795-832.
- Jansen, Bert, Hilda Koopman, and Pieter Muysken. 1978. Serial verbs in the creole languages. *Amsterdam Creole Studies* 2:125-159.
- Kayne, Richard S. 1994. *The Antisymmetry of Syntax*. Cambridge: MIT Press.
- Kratzer, Angelika. 2004. Building resultatives. Manuscript. <http://semanticsarchive.net/Archive/GY4ZThjZ/Building%20Resultatives.pdf>
- Levin, Beth, and Malka Rappaport Hovav. 1995. *Unaccusativity: At the Syntax-Lexical Semantics Interface*. Cambridge: MIT Press.
- Li, Yafei. 1990. On V-V compounds in Chinese. *Natural Language and Linguistic Theory* 8.2:177-207.
- Li, Yafei. 1993. Structural head and aspectuality. *Language* 69.3:480-504.
- Li, Yafei, and Jen Ting. 2011. Linear iconicity in the serial verb construction: Its nature and use. Manuscript. Madison: University of Wisconsin; Taipei: National Taiwan Normal University.
- Muysken, Pieter. 1987. Parameters for serial verbs. *Niger-Congo Syntax and Semantics* I, ed. by Victor Manfredi, 65-75. Boston: African Studies Center, Boston University.



- Newmeyer, Frederick J. 1998. *Language form and Language Function*. Cambridge: MIT Press.
- Newmeyer, Frederick J. 2004. Some thoughts on the serial verb construction. Invited talk given at the Workshop “La notion de ‘construction verbale en série’: Est-elle une notion opératoire?”. Paris: EHESS.
- Song, Hongkyu. 2005. *Causatives and Resultatives in Korean*. Madison: University of Wisconsin dissertation.
- Tai, James H-Y. 1985. Temporal sequence and Chinese word order. *Iconicity in Syntax*, ed. by John Haiman, 49-72. Amsterdam & Philadelphia: John Benjamins.
- Ting, Jen, and Yafei Li. 1997. Manner *-de* and resultative *-de*. Paper presented at the 6<sup>th</sup> Annual Conference of the International Association of Chinese Linguistics (IACL-6), June 19-21, 1997. Leiden: University of Leiden.
- Williamson, Kay. 1965. *A Grammar of the Kolokuma Dialect of Ijo*. Cambridge & New York: Cambridge University Press.

[Received 8 May 2012; revised 20 June 2013; accepted 22 June 2013]

Yafei Li  
Department of Linguistics  
University of Wisconsin-Madison  
Madison, WI 53706  
USA  
yafeili@wisc.edu

Jen Ting (correspondence author)  
Department of English  
National Taiwan Normal University  
162, Sec. 1, Heping East Road  
Taipei 106, Taiwan  
ting@ntnu.edu.tw

## 普遍語法像一塊瑞士乳酪嗎？ 為“第三因素原則”提出證據

李亞非<sup>1,2</sup> 丁 仁<sup>3</sup>

南京大學<sup>1</sup>

威斯康辛大學麥迪遜分校<sup>2</sup>

國立臺灣師範大學<sup>3</sup>

本文主張連動式為“第三因素原則”提供了證據。雖然我們目前所知道的普遍語法根據階層結構將句法結構做線性化，但連動式動詞的線性化卻是依據語序時序對應關係。在這後一種情況下，相同語意關係對應到相同語序，卻可以表現成不同的句法內部結構。使用語序時序對應關係來達到句法成分之線性化，可視為一般性的認知機制在發揮作用，其出現條件恰恰反映了普遍語法在結構生成功能上的一個空檔。

關鍵詞：連動式，第三因素原則，語序時序對應，普遍語法