Modelling Verb Order in Complex Multi-Verbal Predicate Constructions

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1. Introduction[1]

Verb order is an important issue in complex multi-verbal predicate constructions, for example, serial verb constructions (SVCs). With more than one verb in the construction, how are the verbs sequenced? What constraints are at play to govern their order? In this paper, we attempt to investigate several constraints that are related to the issue. We also propose a different ranking of these constraints for Cantonese, a Yue dialect spoken in the southeastern parts of China, and Dagaare, a Gur language spoken in the northwestern areas of Ghana, to account for the different verb orderings found in these two languages for SVCs.

We adopt an optimality-theoretic approach in our analysis. One of the advantages of doing so is that languages can be compared quite easily and effectively. This is because in Optimality Theory (OT), constraints are ranked. Each language has a different ranking of constraints and it is the rankings of the same set of constraints that are compared. This is the focus of the paper. A number of constraints are ranked and the rankings are used to account for and to compare the verb order phenomena of Cantonese and Dagaare SVCs.

The outline of our paper is as follows. We first undertake a brief survey of the phenomenon of SVCs in section 2. We then investigate each constraint that will be employed in our analysis of verb order in SVCs in section 3. In section 4 we attempt to model the verb order of Cantonese SVCs. Section 5 provides an account of the verb order of Dagaare SVCs. Section 6 concludes the paper.

2. The Phenomenon – Serial Verb Constructions (SVCs)

Cantonese and Dagaare both allow verb serialization. A serial verb construction is, very broadly speaking, a construction that has two or more lexical verbs within a single clause. None of the verbs can be considered as contributing 'less' to the semantics of the whole construction, unlike the constructions which involve 'light' verbs in the Romance languages. Also unlike these constructions, the choice of verbs in SVCs is rather flexible. Verb serialization is not confined to any particular verbs. Consider the Cantonese SVC example in (1):

(1)

我	緊	車		接	你	呀
ngo5	*zaa1_gan2*	*ce1*	*lai4*	*zip5*	*lei5*	*aa3*[2]
1.SG	drive.PROG	car	come	pick-up	2.SG	PART[3].

'I am on my way to pick you up.'

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[1] We thank Mary Dalrymple for giving us useful comments on this paper.

[2] The romanization scheme adopted in this paper is based on the one developed by The Linguistic Society of Hong Kong (2002). There are altogether six tones in this scheme: 1 = high level; 2 = high rising; 3 = mid level; 4 = low falling; 5 = low rising; 6 = low level. The tone is marked at the end of each character.

[3] Symbols and abbreviations used in this paper:
* = Ungrammaticality/ Violation of Constraint; ! = Fatal Violation; ☞ = Optimal Output; 1 = First Person; 2 = Second Person; COMP = Complementizer; FOC = Focus Marker; NOM = Nominalizing Particle; PART = Particle; PROG = Progressive Aspect; SG = Singular.

The SV construction in (1) has three verbs. They are, namely, *zaa1* 'to drive', *lai4* 'to come' and *zip5* 'to pick (somebody) up'. With more than one verb, a reasonable question to ask is why the verbs are ordered the way they are ordered. Why, for example, are (2) and (3) unacceptable?

(2)	*我		緊	車	接	你	呀
	ngo5	*lai4*	*zaa1_gan2*	*ce1*	*zip5*	*lei5*	*aa3*
	1.SG	come	drive.PROG	car	pick-up	2.SG	PART.

(3)	*我	接	你		緊	車	呀
	ngo5	*zip5*	*lei5*	*lai4*	*zaa1_gan2*	*ce1*	*aa3*
	1.SG	pick-up	2.SG	come	drive.PROG	car	PART.

The verbs that make up the SVC in (2) and (3) are identical to the ones that make up the SVC in (1). The only difference lies in the order of the verbs.

3. The Constraints

3.1 PTP

One of the many constraints that governs the ordering of verbs in an SVC is the Principle of Temporal Precedence (Bodomo 1997:38), as shown in (4):

(4) The Principle of Temporal Precedence (PTP)
Let S=SVC and E=Event,
Let v1 and v2 = Verbs in S and e1 and e2 = parts of E
Suppose S is a grammatical encoding of E and
v1 and v2 encode e1 and e2 respectively,
If e1 temporally precedes e2
Then v1 must structurally precede v2.

This constraint is reformulated as:

(5) PTP (Following Kager (1999:251))
'The precedence structure of the VPs in an SVC is consistent with that of the actions in its corresponding event structure.'

Let $\alpha, \beta \in$ VPs in SVC and $\alpha', \beta' \in$ actions in event structure
If $\alpha \, R \, \alpha'$ and $\beta \, R \, \beta'$, then
$\alpha < \beta$ iff $-(\beta' < \alpha')$

PTP aims at capturing the iconicity between syntax and semantics. If a part of an event e1 is conceptualized as occurring before another part of the event e2, then the ideal case would be to have the structure encoding this event reflect this linear relationship. The cases, however, are not always ideal. In Cantonese, for instance, examples where PTP is violated can be easily found, as (6) shows:

(6)	接	你	呀	我	緊	車	
	zip5	*lei5*	*aa3*	*ngo5*	*zaa1_gan2*	*ce1*	*lai4*
	pick-up	2.SG	PART.	1.SG	drive.PROG	car	come

'I am picking you up and I am coming on my car.'

PTP is violated in (6). The default order of actions in the event should be 'drive, come and pick (you) up'. This order is iconically realized in the SVC in (1), which is the canonical, or most unmarked, structure. The fact that the violation of PTP in (6) does not result in the ungrammaticality of the sentence indicates that there must be, in this language at least, a constraint that outranks PTP. This ranking would give an output that does not observe PTP, as in the case of (6).

3.2 NEW

One constraint that appears to militate against PTP is NEW. NEW is a pair of correspondence constraints between c(onstituent)-structure and i(nformation)-structure (Choi 2001). NEW includes:

(7) NEW (Choi 2001:34)[4]
NEW-R : [+New] aligns right in the clause.
NEW-L: [+New] aligns left in the clause.

For NEW-L and NEW-R, one violation is incurred for every unit that stands between the target unit and the relevant edge.

[±New] is an information feature. Each constituent in a clause is assigned a value for this feature based on its discourse status. A constituent is assigned [+New] if it is the focus or new information, and conversely. NEW-R requires that the constituent that has the feature [+New] align right in the clause, while NEW-L requires it to align left. Whether a [+New] constituent aligns left or right is a language-specific option, but since there are languages that select either option, both constraints are required in the universal set of constraints. Some languages even allow both options (Samek-Lodovici 2001, cited in Choi 2001). If a language aligns the focused constituent leftwards, then NEW-L is ranked higher than NEW-R in that language, and *vice versa*. Data show that, as both Cantonese and Dagaare align the focused constituents leftwards, they have the same ranking with regard to this pair of constraints:

(8) NEW-L >> NEW-R

3.3 *RED

Not all languages allow PTP to be violated, not even when one of the VPs in the SVC is focused. Dagaare is a case in point. In Dagaare, the effect of PTP is so strong that no other factor seems to be able to disrupt the order of VPs. This indicates that PTP is ranked very high in this language.
How is focus marked in this language then? Consider (9):

(9) a. *oƎ ζoƎ γαƎαƎ νψυ≅ λα≅ κoƎ ≅*
3.SG run go drink FACT. water
'S/he runs to get water to drink.'

b. *κoƎ ≅ νψυ≅υƎ λα≅ κα≅ o≅ ζoƎ γαƎαƎ νψυ≅*
water drink.NOM FACT. COMP 3.SG run go drink
'Drinking water, s/he gets water to drink.'

[4] 'Left' here refers to the left edge of the sentence, while 'right' refers to the right edge of the sentence. The assumption seems to be that sentences in languages are written from left to right. This may cause problems to cultures which are known to record their language on paper from right to left, for instance, Chinese and Arabic. Perhaps less-confusing names for this pair of constraints would be NEW-BEGIN and NEW-END. This would solve the problem quite easily as each sentence, no matter how it is written and whether it is written or spoken, must have a beginning and an end.

If a VP is focused, in other words, assigned [+New], in this language, it will be realized by its nominalized form. It is the nominalized form that aligns with the left edge of the sentence, as (9b) shows. The VP stays in its ordinary position to maintain the default verb order.

As this process is not universal, for example, this process is not found in Cantonese, there must be constraints that prevent this from happening. A constraint that would serve this function is *RED, defined below in (10):

(10) *RED(UNDANT)
Any redundant c-structure constituent is not allowed. A redundant c-structure constituent is one which does not contribute unique information to any of its parallel structures (e.g. f(unctional)-structure).

For *RED, one violation is incurred for every redundant c-structure constituent.

This constraint is ranked higher than PTP in Cantonese, but is ranked lower than PTP in Dagaare. In Cantonese, PTP can be violated, provided that the VP that is responsible for the violation is focused. As the discourse status of the VP is the motivation for the violation of PTP, NEW-L must be higher-ranked than PTP. In Dagaare, however, PTP cannot be violated, regardless of the discourse status of the VPs in the SVC. Focus is marked by repeating and nominalizing the focused VP at the beginning of the clause. NEW-L is still observed in this case, as the focused constituent still aligns left. The rankings of all the constraints discussed in this section for Cantonese and Dagaare are given in (11):

(11) a. Ranking for Cantonese:
*RED, New-L >> PTP >> NEW-R

b. Ranking for Dagaare:
PTP, NEW-L >> NEW-R, *RED

4. Modelling Verb Order in Cantonese SVCs

In this section, Cantonese SVCs will be analyzed and their verb order will be accounted for using the ranking in (11a).

Consider (1) again, repeated below in (12):

(12)

我	緊	車		接	你	呀
ngo5	*zaa1_gan2*	*ce1*	*lai4*	*zip5*	*lei5*	*aa3*
1.SG	drive.PROG	car	come	pick-up	2.SG	PART.

'I am on my way to pick you up.'

The SVC in (12) is made up of three VPs. They are:

(13) a. [*zaa1_gan2 ce1*]$_{VP}$
drive.PROG car

b. [*lai4*]$_{VP}$
come

c. [*zip5 lei5*]$_{VP}$
pick-up 2.SG

These three VPs, if permutated freely, give rise to *six* possible orders of VPs in an SVC[5]:

(14) a. [*zaa1_gan2 ce1*]$_{VP}$ [*lai4*]$_{VP}$ [*zip5 lei5*]$_{VP}$ *aa3*[6]
b. *[*zaa1_gan2 ce1*]$_{VP}$ [*zip5 lei5*]$_{VP}$ *aa3* [*lai4*]$_{VP}$
c. *[*lai4*]$_{VP}$ [*zaa1_gan2 ce1*]$_{VP}$ [*zip5 lei5*]$_{VP}$ *aa3*
d. [*lai4*]$_{VP}$ [*zip5 lei5*]$_{VP}$ *aa3* [*zaa1_gan2 ce1*]$_{VP}$
e. [*zip5 lei5*]$_{VP}$ *aa3* [*zaa1_gan2 ce1*]$_{VP}$ [*lai4*]$_{VP}$
f. *[*zip5 lei5*]$_{VP}$ *aa3* [*lai4*]$_{VP}$ [*zaa1_gan2 ce1*]$_{VP}$

As can be seen from (14), not all possible verb orders are allowed. We shall account for all these with the ranking given in (11a) for Cantonese. First, assume that none of the VPs is assigned the feature [+New], or focused. Consider the tableau in (15):

(15)

Input: Order of actions = [*zaa1_gan2 ce1*]$_{[-New]}$ + [*lai4*]$_{[-New]}$ + [*zip5 lei5*]$_{[-New]}$		NEW-L	*RED	PTP	NEW-R
a. ☞	[*zaa1_gan2 ce1*]$_{VP}$ [*lai4*]$_{VP}$ [*zip5 lei5*]$_{VP}$ *aa3*				
b.	[*zaa1_gan2 ce1*]$_{VP}$ [*zip5 lei5*]$_{VP}$ *aa3* [*lai4*]$_{VP}$			*!*	
c.	[*lai4*]$_{VP}$ [*zaa1_gan2 ce1*]$_{VP}$ [*zip5 lei5*]$_{VP}$ *aa3*			*!*	
d.	[*lai4*]$_{VP}$ [*zip5 lei5*]$_{VP}$ *aa3* [*zaa1_gan2 ce1*]$_{VP}$			*!	
e.	[*zip5 lei5*]$_{VP}$ *aa3* [*zaa1_gan2 ce1*]$_{VP}$ [*lai4*]$_{VP}$			*!	
f.	[*zip5 lei5*]$_{VP}$ *aa3* [*lai4*]$_{VP}$ [*zaa1_gan2 ce1*]$_{VP}$			*!*	

As can be seen from the tableau in (15), (15a) is the optimal candidate because it does not violate PTP (and other constraints in this case) at all. All the other candidates have different degrees of violation of PTP. The constraint NEW-R in this case does not affect the selection of the optimal candidate. This is because any violation of PTP, a higher-ranked constraint than NEW-R, is enough to eliminate the chance of that candidate being the optimal output. Tableau (15) shows that, if none of the VPs in the SVC is focused, the order of verbs in (15a) will emerge as the most unmarked, or the canonical, order. This is because one of the highest-ranked constraints, NEW-L, is vacuously satisfied as there is no [+New] constituent in this case.

Now, suppose that one of the VPs is focused, or bears the [+New] feature, which verb order will survive as the optimal candidate? We shall first consider the case in which the VP *zaa1_gan2 ce1* bears the [+New] feature:

[5] The examples given in (13) are by no means an exhaustive list of all the possible *word* orders. We must emphasize that, for the time being, we are only concerned with the *verb* order of SVCs. The word order in Cantonese, in general, also involves issues such as *pro*-drop, the position of the pronoun if not dropped and the position of the particle *aa3*. All these make the whole picture of *word* order involving SVCs in Cantonese far too complicated for the scope of this paper.

[6] We will assume for now that the particle must occur *after* the VP that appears last in the canonical order of verbs, i.e. the VP [*zip5 lei5*] in this case.

(16)

Input: Order of actions = [*zaa1_gan2 ce1*]$_{[+New]}$ + [*lai4*]$_{[-New]}$ + [*zip5 lei5*]$_{[-New]}$		NEW-L	*RED	PTP	NEW-R
a. ☞	[*zaa1_gan2 ce1*]$_{VP}$ [*lai4*]$_{VP}$ [*zip5 lei5*]$_{VP}$ *aa3*				
b.	[*zaa1_gan2 ce1*]$_{VP}$ [*zip5 lei5*]$_{VP}$ *aa3* [*lai4*]$_{VP}$			**	
c.	[*lai4*]$_{VP}$ [*zaa1_gan2 ce1*]$_{VP}$ [*zip5 lei5*]$_{VP}$ *aa3*	*!			
d.	[*lai4*]$_{VP}$ [*zip5 lei5*]$_{VP}$ *aa3* [*zaa1_gan2 ce1*]$_{VP}$	*!**			
e.	[*zip5 lei5*]$_{VP}$ *aa3* [*zaa1_gan2 ce1*]$_{VP}$ [*lai4*]$_{VP}$	*!*			
f.	[*zip5 lei5*]$_{VP}$ *aa3* [*lai4*]$_{VP}$ [*zaa1_gan2 ce1*]$_{VP}$	*!**			
g.	[*zaa1_gan2 ce1*]$_{VP}$ [*zaa1_gan2 ce1*]$_{VP}$ [*lai4*]$_{VP}$ [*zip5 lei5*]$_{VP}$ *aa3*		*!**		

Tableau (16) shows that the optimal candidate is still the (a) candidate. With the VP *zaa1_gan2 ce1* bearing the [+New] feature, not only do candidates (16c) to (16f) incur different degrees of violation of PTP, they also violate NEW-L to different extents. Candidate (16g) is designed to imitate the Dagaare way of marking focus. This candidate is also out because it violates *RED, which, according to the ranking in Cantonese, is not allowed. The only two candidates that remain after the 'first round of competition' are (16a) and (16b). However, in this 'round', (16b) loses because it violates PTP while (16a) has no violation of PTP. (16a) survives as the optimal output.

This result is indeed quite logical. Even with the VP *zaa1_gan2 ce1* bearing the focus, the verb order does not have to be changed compared with that of the optimal output in tableau (16) (the canonical verb order) because this VP is already the leftmost VP.

Similar cases happen when the other two VPs in the SVC bear the [+New] feature. Consider tableaux (17) and (18):

(17)

Input: Order of actions = [*zaa1_gan2 ce1*]$_{[-New]}$ + [*lai4*]$_{[+New]}$ + [*zip5 lei5*]$_{[-New]}$		NEW-L	*RED	PTP	NEW-R
a.	[*zaa1_gan2 ce1*]$_{VP}$ [*lai4*]$_{VP}$ [*zip5 lei5*]$_{VP}$ *aa3*	*!			
b.	[*zaa1_gan2 ce1*]$_{VP}$ [*zip5 lei5*]$_{VP}$ *aa3* [*lai4*]$_{VP}$	*!**			
c.	[*lai4*]$_{VP}$ [*zaa1_gan2 ce1*]$_{VP}$ [*zip5 lei5*]$_{VP}$ *aa3*			**	
d. ☞	[*lai4*]$_{VP}$ [*zip5 lei5*]$_{VP}$ *aa3* [*zaa1_gan2 ce1*]$_{VP}$			*	
e.	[*zip5 lei5*]$_{VP}$ *aa3* [*zaa1_gan2 ce1*]$_{VP}$ [*lai4*]$_{VP}$	*!**			
f.	[*zip5 lei5*]$_{VP}$ *aa3* [*lai4*]$_{VP}$ [*zaa1_gan2 ce1*]$_{VP}$	*!*			
g.	[*lai4*]$_{VP}$ [*zaa1_gan2 ce1*]$_{VP}$ [*lai4*]$_{VP}$ [*zip5 lei5*]$_{VP}$ *aa3*		*!		

(18)

Input: Order of actions = [*zaa1_gan2 ce1*]$_{[-New]}$ + [*lai4*]$_{[-New]}$ + [*zip5 lei5*]$_{[+New]}$		NEW-L	*RED	PTP	NEW-R
a.	[*zaa1_gan2 ce1*]$_{VP}$ [*lai4*]$_{VP}$ [*zip5 lei5*]$_{VP}$ *aa3*	*!*			
b.	[*zaa1_gan2 ce1*]$_{VP}$ [*zip5 lei5*]$_{VP}$ *aa3* [*lai4*]$_{VP}$	*!			
c.	[*lai4*]$_{VP}$ [*zaa1_gan2 ce1*]$_{VP}$ [*zip5 lei5*]$_{VP}$ *aa3*	*!*			
d.	[*lai4*]$_{VP}$ [*zip5 lei5*]$_{VP}$ *aa3* [*zaa1_gan2 ce1*]$_{VP}$	*!			
e. ☞	[*zip5 lei5*]$_{VP}$ *aa3* [*zaa1_gan2 ce1*]$_{VP}$ [*lai4*]$_{VP}$			*	
f.	[*zip5 lei5*]$_{VP}$ *aa3* [*lai4*]$_{VP}$ [*zaa1_gan2 ce1*]$_{VP}$			**	
g.	[*zip5 lei5*]$_{VP}$ [*zaa1_gan2 ce1*]$_{VP}$ [*lai4*]$_{VP}$ [*zip5 lei5*]$_{VP}$ *aa3*		*!*		

The high ranking of the constraint NEW-L requires the focused VP to align left. This ranking eliminates all those candidates that have the [-New] constituents at the left edge. Candidates (17g) and (18g) are also eliminated as they violate *RED. The two remaining candidates in both cases have the [+New] VP at the left edge, thus satisfying NEW-L. Among them, the candidate that has fewer violations of PTP, candidate (d) in (17) and candidate (e) in (18) respectively, becomes the optimal candidate.

5. Modelling Verb Order in Dagaare SVCs

The same set of constraints that has been used to model verb order in Cantonese SVCs can also be used to account for the verb order in Dagaare SVCs. In fact, unlike Cantonese, only one verb order is allowed in Dagaare. This is because PTP is ranked high in this language. Consider tableau (19):

(19)

Input: Order of actions = [ζoƎ]$_{[-New]}$ + [γαƎαƎ]$_{[-New]}$ + [vψυ≅ κoƎ ≅]$_{[-New]}$	PTP	NEW-L	NEW-R	*RED
a. ☞ oƎ [ζoƎ]$_{[VP]}$ [γαƎαƎ]$_{[VP]}$ [vψυ≅ λα≅ κoƎ ≅]$_{[VP]}$				
b. [ζo≅o≅υ≅]$_{[NP]}$ λα≅ κα≅ o≅ [ζoƎ]$_{[VP]}$ [γαƎαƎ]$_{[VP]}$ [vψυ≅ κoƎ ≅]$_{[VP]}$				*
c. [γα≅α≅o≅]$_{[NP]}$ λα≅ κα≅ o≅ [ζoƎ]$_{[VP]}$ [γαƎαƎ]$_{[VP]}$ [vψυ≅ κoƎ ≅]$_{[VP]}$				*
d. [κoƎ ≅ vψυ≅υƎ]$_{[NP]}$ λα≅ κα≅ o≅ [ζoƎ]$_{[VP]}$ [γαƎαƎ]$_{[VP]}$ [vψυ≅ κoƎ ≅]$_{[VP]}$				**
e. [ζoƎ]$_{[VP]}$ oƎ [γαƎαƎ]$_{[VP]}$ [vψυ≅ λα≅ κoƎ ≅]$_{[VP]}$	*!			
f. [γαƎαƎ]$_{[VP]}$ oƎ [ζoƎ]$_{[VP]}$ [vψυ≅ λα≅ κoƎ ≅]$_{[VP]}$	*!*			
g. [vψυ≅ λα≅ κoƎ ≅]$_{[VP]}$ oƎ [ζoƎ]$_{[VP]}$ [γαƎαƎ]$_{[VP]}$	*!			

There are seven candidates in tableau (19). The candidates that are first eliminated from being the optimal output are (19e), (19f) and (19g). These three candidates all incur violations of PTP, one of the two highest ranked constraints. Of the four candidates that remain, candidates (19b), (19c) and (19d) are also out because they violate *RED. Candidate (19a) becomes the optimal output by having no violations for all of the relevant constraints.

The constraints NEW-L and NEW-R are vacuously satisfied for all seven candidates. With none of the VPs bearing the [+New] feature, none of them has to align either direction. Even with one of the VPs bearing the [+New] feature, the order of the VPs is still the same within the SVC. This, again, is due to the high ranking of PTP. Consider (20):

(20)

Input: Order of actions = [ζoƎ]$_{[+New]}$ + [γαƎαƎ]$_{[-New]}$ + [vψυ≅ κoƎ ≅]$_{[-New]}$	PTP	NEW-L	NEW-R	*RED
a. oƎ [ζoƎ]$_{[VP]}$ [γαƎαƎ]$_{[VP]}$ [vψυ≅ λα≅ κoƎ ≅]$_{[VP]}$		*!		

		PTP	NEW-L	NEW-R	*RED
b.	☞ [ζο≅ο≅υ≅]$_{[NP]}$ λα≅ κα≅ ο≅ [ζο∃]$_{[VP]}$ [γα∃α∃]$_{[VP]}$ [νψυ≅ κο∃ ≅]$_{[VP]}$				
c.	[γα≅α≅ο≅]$_{[NP]}$ λα≅ κα≅ ο≅ [ζο∃]$_{[VP]}$ [γα∃α∃]$_{[VP]}$ [νψυ≅ κο∃ ≅]$_{[VP]}$		*!***		
d.	[κο∃ ≅ νψυ≅υ∃]$_{[NP]}$ λα≅ κα≅ ο≅ [ζο∃]$_{[VP]}$ [γα∃α∃]$_{[VP]}$ [νψυ≅ κο∃ ≅]$_{[VP]}$		*!***		

Candidates (20a), (20c) and (20d) incur different degrees of violations for the constraint NEW-L. In all of them, the focused constituent does not align left. (20b) is the only candidate that satisfies NEW-L. It is only in this structure that the constituent that bears the [+New] feature aligns left. An interesting point about this structure is that NEW-L is not satisfied by a VP, but by an NP. By aligning the NP that bears the focus with the left edge of the sentence, NEW-L can be satisfied even with the order of the verbs in the SVC retained, thus satisfying PTP simultaneously. This may be regarded as the Dagaare solution for the competition between PTP, which strives to keep the order of verbs the same as the order of actions they encode, and NEW-L, which tend to disrupt the verb order (as shown for the Cantonese examples above). The solution, of course, is brought about at the expense of violating *RED.
Assigning the [+New] feature to the VPs *γα∃α∃* and *νψυ≅ κο∃ ≅* will give similar results. Consider the tableau in (21):

(21)

Input: Order of actions = [ζο∃]$_{[-New]}$ + [γα∃α∃]$_{[+New]}$ + [νψυ≅ κο∃ ≅]$_{[-New]}$		PTP	NEW-L	NEW-R	*RED
a.	ο∃ [ζο∃]$_{[VP]}$ [γα∃α∃]$_{[VP]}$ [νψυ≅ λα≅ κο∃ ≅]$_{[VP]}$		*!*		
b.	[ζο≅ο≅υ≅]$_{[NP]}$ λα≅ κα≅ ο≅ [ζο∃]$_{[VP]}$ [γα∃α∃]$_{[VP]}$ [νψυ≅ κο∃ ≅]$_{[VP]}$		*!****		
c.	☞ [γα≅α≅ο≅]$_{[NP]}$ λα≅ κα≅ ο≅ [ζο∃]$_{[VP]}$ [γα∃α∃]$_{[VP]}$ [νψυ≅ κο∃ ≅]$_{[VP]}$				
d.	[κο∃ ≅ νψυ≅υ∃]$_{[NP]}$ λα≅ κα≅ ο≅ [ζο∃]$_{[VP]}$ [γα∃α∃]$_{[VP]}$ [νψυ≅ κο∃ ≅]$_{[VP]}$		*!****		

If *γα∃α∃* is assigned [+New], the optimal output will be (21c), which is the only candidate that completely satisfies NEW-L as shown in (21). Although (21c) survives as the optimal output, this structure is not allowed in Dagaare. This is perhaps due to the semantics of the structure. *Gα∃α∃* 'to go', or its nominal counterpart *γα≅α≅ο≅*, though by itself it is a word that denotes an action, is more of a word that denotes direction in the structure. The 'direction' meaning can only be obtained if it is realized with a 'verb of action'. Separating the word that denotes direction from the word that denotes action may pose interpretation problems for the speaker/hearer. This may have caused the unacceptability of (21c). A relevant question is, of course, whether there is communicative motivation to focus on *γα∃α∃*, i.e. whether there is motivation to assign [+New] to *γα∃α∃* in the input.

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[7] There is a total of six violations for NEW-R because there are six constituents between the right edge of the sentence and *ζο≅ο≅υ≅*. *Zο∃* cannot be the constituent that bears the focus here as this discourse function is already realized by *ζο≅ο≅υ≅*. An additional piece of evidence showing that *ζο∃* is not the focused constituent comes from the fact that *ζο∃* cannot bear any emphatic stress. Placing the stress on *ζο≅ο≅υ≅*, however, is acceptable.

[8] See footnote 4 for (similar) explanation.

Focusing on the VP *vψυ≅ κοƎ ≅* is acceptable:

(22)

Input: Order of actions = [ζοƎ][-New] + [γαƎαƎ][-New] + [vψυ≅ κοƎ ≅][+New]	PTP	NEW-L	NEW-R	*RED
a. oƎ [ζοƎ][VP] [γαƎαƎ][VP] [vψυ≅ λα≅ κοƎ ≅][VP]		*!**		
b. [ζο≅ο≅υ≅][NP] λα≅ κα≅ ο≅ [ζοƎ][VP] [γαƎαƎ][VP] [vψυ≅ κοƎ ≅][VP]		*!*****		
c. [γα≅α≅ο≅][NP] λα≅ κα≅ ο≅ [ζοƎ][VP] [γαƎαƎ][VP] [vψυ≅ κοƎ ≅][VP]		*!*****		
d. [κοƎ ≅ vψυ≅υƎ][NP] λα≅ κα≅ ο≅ [ζοƎ][VP] [γαƎαƎ][VP] [vψυ≅ κοƎ ≅][VP]			******[9]	**
e. ☐ [κοƎ ≅ vψυ≅υƎ][NP] λα≅ κα≅ ο≅ [ζοƎ][VP] [γαƎαƎ][VP] [vψυ≅][VP]			******	*

Only candidates (22d) and (22e) satisfy NEW-L. (22e) becomes the optimal output because it has one violation less for *RED than (22d). In (22d), there are two redundant c-structure constituents, namely, *vψυ≅* and *κοƎ ≅*. This incurs two violations for *RED. In (22e), however, only *vψυ≅* is redundant. This results in only one violation for *RED.

A comment needs to be made on the distribution of *λα≅*. *Lα≅* has been analyzed as the factitive or affirmative marker (Bodomo 1997:64). This particle marks affirmation (polarity) of the sentence. It also '[marks] emphasis of particular aspects of the sentence' (Bodomo 1997:65). It is required for every affirmative sentence in Dagaare. The default position for this particle is after the verb(s) and before a full NP object (if this is present). This explains the distribution of *λα≅* in (22a). In (22a), *λα≅*, in fact, should not be analyzed as part of the VP *vψυ≅ κοƎ ≅*. The only reason that *λα≅* appears after *vψυ≅*, or actually, *ζοƎ γαƎα vψυ≅*, is this is the position after the verb(s) and before the full NP object. That *λα≅* appears after the whole series of verbs but not after the first verb can be taken as evidence that there is syntactic and semantic integrity among the verbs, i.e. that the construction an SVC. In (22e) (and in the other focus-realized constructions), however, *λα≅* appears after the focus and before the verbs. This is because *λα≅* serves as the emphatic focus marker, indicating that *κοƎ ≅ vψυ≅υƎ* is the focus of the sentence. That *λα≅* appears *after* the VP *κοƎ ≅ vψυ≅υƎ* but not *within* it provides support that it is not part of the VP. Focus in Dagaare is not only marked by word order but also by the position of the factitive/emphatic focus marker *λα≅*.

6. Conclusion

We have demonstrated in this paper that verb order in serial verb constructions can be successfully accounted for by the interaction of four constraints. These constraints are PTP, NEW-L, NEW-R and *RED. PTP requires that the order of actions in a complex event be reflected iconically by the order of verbs that denote these actions. NEW-L and NEW-R are constraints that seem to be militating against PTP by demanding that the focused constituent align with the left or the right edge of the sentence. In both Cantonese and Dagaare, the alignment is oriented to the left edge of the sentence. *RED is one version of the general Economy Principle. C-structure constituents that do not contribute unique information to any of the parallel structures should be eliminated. In other words, useless or redundant c-structure constituents should not be allowed.

[9] See footnote 4 for (similar) explanation.

These four constraints have different patterns of interaction in the two languages under consideration. More specifically, they are ranked differently in the two languages. The different rankings give rise to very different verb order phenomena in the SVCs of the two languages. In Cantonese, NEW-L and *RED are ranked higher than PTP and NEW-R such that focus is realized by the left-alignment of the focused VP at the expense of PTP. The case is very different in Dagaare. In this language, PTP plays a much more important role. PTP and NEW-L outrank *RED and NEW-R. The iconic order of verbs must be preserved in Dagaare. Focus is marked by the left-alignment of the NP, which is a morphological derivative of the corresponding verb, and the occurrence of the emphatic focus marker after the NP. PTP is satisfied at the cost of NEW-L and *RED.

One of the major advantages for adopting an optimality-theoretic approach in the analysis is that in such an analysis, failure to satisfy certain (lower-ranked) constraints is allowed. This makes it possible to account for data from different languages, as we have done for Cantonese and Dagaare, or even apparently 'contradicting' data within the same language, as the approach we have taken with respect to the seemingly 'opposing' forces of NEW-L and PTP in Cantonese, with only a small set of constraints. An approach that does not recognize the possibility of constraint violation will likely create a much larger set of constraints to account for the same data, with the need to include many 'exceptions', which, in the authors' opinion, will make weaker a case for the generalizations that can be made across languages.

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