

# The Origin of the Wackernagel Effect in Serbo-Croatian

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This paper aims to unravel the syntax of Serbo-Croatian clitics, which tend to cluster in the second position of the sentence (Wackernagel's Law). It is shown that this phenomenon rises from a morphological peculiarity of the auxiliary verbs in that their conjugation consists of a compound of two morphemes, one of which shows a floating melody, i.e. not associated to the skeleton. Then either a default rule associating the melody to the skeleton takes place in the morphology, in which case the full form surfaces, or else the auxiliary compound enters the syntax, where the floating melody must be eliminated. This is realized by the mandatory adjunction of the auxiliary to a suitable element. By virtue of the temporal adjunction, the deficient morpheme, which is not in the path of the linearization process, is filtered out as stray. As a result, one morpheme surfaces as a clitic. This analysis obviously predicts that both the third person clitic *je*, and the reflexive *se*, which carry the deficient morpheme on their right side (*jeste*, *sebe*) must postpone their placement at the end of the cluster, for whatever material adjoined to them will anchor to the stray morpheme and will disappear with it at the end of the derivation. This morphological peculiarity, together with the widespread specification of the feature  $\omega$  (which may induce a superiority effect) in various paradigms, accounts for the complexities observed in this language. SC offers a new insight on the role of the adjunction and the subsequent linearization process, which turns out to be much more than a simple pronunciation protocol between the grammar and the oral modality.

**Keywords:** syntactic features, constraints, vectors, operators, adjunction, skeleton, directionality, word order, coreference, pronoun, anaphor, morphology, phonology, syntax.

## 1. Introduction

Serbo-Croatian clitics, as is well known, appear in the second position of their structure, which is traditionally known as Wackernagel effect. Such a position is variously characterized in the literature: it is either the first word, the first phrase or the first element in an intonational group (see Bošković 2004, Čamdžić and Hudson 2007, Schütze 1994 for details and references therein). It can be that of a single clitic or a cluster of clitics. In the latter case, all clitics are rigidly ordered as follows: *li* (interrogative) > all auxiliaries but *je* > pronominal > reflexive > auxiliary *je*.

Various accounts of these SC facts can be found in many theoretical frameworks, including the Minimalist Program and its ancestors (cf. Bošković 2004 for further references), Word Grammar (Čamdžić and Hudson 2007), Categorical Grammar (Mihalicek 2012), etc. In general, those accounts assume that clitics form a grammatical category in themselves, thus eluding the question why similar elements in other languages are not clitics; and often the order of the clitics is taken for granted, as it is usually defined in a template.

In this paper, I propose a syntactic analysis of SC clitics, which is couched in a feature- and constraint-based theory of grammar, as discussed in Desouvrey (2000) and other works. I will show

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<sup>1</sup> Comments are welcome.

that movement, placement, and ordering of clitics follow from general principles that have been used to account for Romance clitics, including French, Spanish, Portuguese, Italian, and Romanian, hence nothing specific to SC. In fact, the complexities come from the lexicon to the extent it is there that morphemes are stored with certain morpho-phonological peculiarities. The fact is that instead of having two paradigms for auxiliaries, one for full forms and one for reduced forms (clitics), SC uses a surprising and complex strategy: the conjugation of auxiliary verbs consists of a compound of two morphemes, one of which has a floating melody. The full form is dealt with in the morphology, while the clitic form must be derived in the syntax by adjunction to another element. Under temporal adjunction and the subsequent linearization, which takes place at the skeletal level, the compound is obliterated, giving rise to the emergence of the clitic.

I will proceed as follows. In the next section, I present an overview of the theory I build on; it has more explanatory power while it uses much less machinery than any other theories I know of. (The reader who has read one of my previous papers may skip to section 3). In section 3, I consider what causes so many complexities in SC grammar, namely an extreme freedom of word order induced by the relaxation of head directionality, which is a necessary condition to accommodate the placement of the auxiliaries. In section 4, I tackle the clustering of pronominal clitics with auxiliary clitics and the special behavior of the clitics *je* and *se*. In section 5 and 6, I present two further pieces of evidence based on the interaction of auxiliaries with *wh*-operators and the climbing of clitics to the matrix clause. In section 7, I argue that the clitic *li*, too, rises from a deficient compound. Then in section 8, I discuss some interesting residuals facts, namely the delayed placement of the cluster and its splitting by negation. Finally, I conclude the paper with some remarks on the grammar.

## **2. Overview of a constraint- and feature-based approach to syntax**

### **2.1 Syntactic features**

I will show that Serbo-Croatian follows the same universal principles as Romance clitics. As discussed in Desouvrey (2000, 2005, 2008, 2018, 2019), languages vary according to feature inventory in a given paradigm, which yields various types of complexities. However, the principles that regulate the interaction of these features are universal and apply whenever the conditions are met.

One of the crucial features in this theory is Case, which includes Nominative, Accusative and Oblique. The latter comes with various thematic features such as Dative, Locative, Instrumental, etc., while the former bear a null thematic,  $\emptyset$ . In addition to those traditional features, three further features

have been discovered in natural language in the light of this approach: in the one hand,  $\omega$ - and  $\varphi$ -features, which identify their bearer as a vector and a scalar respectively. A vector is a scopal element such as *wh* and negation; but other syntactic elements may be specified for this feature as well. Thus SC auxiliary clitics, infinitive and tensed verbs, as I will show, are specified for the  $\omega$ -feature. Omega-specified elements (or vectors) are special in that their initial order in the derivation cannot change easily by movement (cf. the Superiority Condition). Quite contrary,  $\varphi$ -features do not have restrictions other than the combinatorial ones, those that are taken into account during the building stage of the structure by a series of merge. Certain elements are neutral, being compatible with both vector and scalar elements. The interesting fact about  $\omega$ -feature is that when two or more  $\omega$ -specified elements are in a morphological or a syntactic compound, they become neutral, and are no longer sensitive to superiority effect and other phenomena regarding vectors. The last important feature is  $\pi$ , which prevents its bearer from adjoining to another element in the structure. Any element bearing such a feature must move outbound, i.e. to an edge of the structure for the purpose of juxtaposition (edge-adjunction). This feature is normally found in *wh*-operators, hence their outbound movement to the left edge of the syntactic structure. As I will show, SC is exceptional in that its *wh*-operators are not  $\pi$ -specified and therefore can cluster together.

It should be emphasized that clitics do not form a category on their own; it is obvious indeed that various types of elements, including auxiliaries, personal pronouns, prepositions, etc., can behave like such. In this theory a clitic can be any element specified with a wealth of features. However, since in SC nouns and adjectives are heavily declined for case and agreement features, unlike Romance languages, it is necessary to further refine this definition: a clitic is an element specified with abstract syntactic features, or fossilized features, and whose morphological shape is not predictable from the general pattern of declension. In addition, they are generally light, i.e. composed of a few phonological segments usually making one syllable. On the other hand, nouns and adjectives get their case by affixation, and take a predictable shape under this mostly regular morphological process. One can say they are heavy in the syntax, hence less prone to undergo adjunction to another element (inbound movement). Instead, they may move to an edge of the structure, for pragmatics or semantics reasons, which are set aside in this paper.

## 2.2 Syntactic principles

A few principles appear to regulate feature interaction. First, consider the operation which builds the

input, i.e. the initial structure of the derivation. Two elements can merge if and only if they are compatible, that is, their features do not clash. Given a head and its complement, it is expected that both are specified for the same features or at least the complement is under-specified (neutral) for the relevant feature of the head. This is the only way to obtain a well-formed structure. If the head and the complement are specified for different features, no merging is possible.

Once the structure is correctly merged, the Obligatory Contour Principle (OCP) (cf. Leben 1973, Goldsmith 1976, etc.) ensures that any complement clitic specified for the same terminal feature as the verb exits the VP domain (1a). Moved elements must skip another element, consistently with a ban on string-vacuous movement, and they must still be adjacent to the head that licenses them. This is forced by another effect of OCP (1b), which is analogous to the gemination effect in non-linear phonology.

(1) **Obligatory Contour Principle**

- a. Case-specified clitics must exit the complement domain of the verb (OCP-1).
- b. No element can intervene between two elements with identical features (OCP-2).

If an element moved by OCP is not  $\pi$ -specified, it must adjoin to another element. The adjunction process consists in linking the leftmost segment of the moved element to the rightmost segment of the host with an association line running from x-slot to x-slot. As a result, and unlike edge-adjoined elements ( $\pi$ -specified), head-adjoined elements come to be in a different timing tier from their host, which itself may have been adjoined.<sup>2</sup> The multi-tiered structure is then conflated by a linearization convention (2) at the end of the derivation. Thus, adjunction to a head results in a syntactic compound in which the host necessarily precedes the adjunct. This process of adjunction and linearization plays a crucial role in SC grammar, as I will show.

(2) **Linearization Convention**

Proceeding from left to right, embed any adjunct tier into the main tier, and to the right of the host element so as to obtain a continuous flow with no back and forth.

Finally, the grammar imposes a strict limit to the number of derivational steps that can proceed from any given input. I refer to this as Derivation Equivalence Number:

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<sup>2</sup> In the expression *head-adjoined*, *head* means any (terminal) element in the structure. It is opposed to edge-adjoined elements, which come to be in juxtaposition with the structure they exit. The term  $X^0$  is not used since it implies further projections which have no relevance in this theory. However, *head* is used also in the sense of complement selecting element, another use that will be clarified when necessary.

(3) **Derivation Equivalence Number (DEN)**

- a. A well-formed syntactic derivation may not contain more than three steps, including the input.
- b. Multiple movement may occur in one step with no return to a higher element.

**3. The SC complexities**

**3.1 Word order**

Serbo-Croatian has seven grammatical cases, including nominative, accusative, dative, genitive, instrumental, locative, and vocative, as well as a rich agreement system. As a result, word order is completely free. Nevertheless, it is generally assumed that the basic word order is SVO, from which the others are derived by movement mostly under pragmatic considerations.

Although the SVO order seems to be the preferred one, it is unlikely that every sentence is derived from it. If this were the case, an element would have to move multiple times to derive certain outputs. Since the grammar is based on economy, the multiple movement analysis is untenable. I claim that four basic word orders are possible, assuming that there is no head directionality for major constituents of the sentence. Thus, a verb and its complement will always be part of the same phrasal constituent, but they need not be in a fixed order. On this view, the subject can appear at either side of a verb-object constituent, as shown in (4).

- (4) a. [S [V O]]  
 b. [[V O] S]

Similarly, an object-verb constituent can have the subject at any side, as in (5).

- (5) a. [S [O V]]  
 b. [[O V] S]

Other combinations are derived by leftward or rightward movement of any of the elements. This can be illustrated with the following three-word sentence which yields 6 possible outputs (After Mihalicek 2012: 1). It is clear, if basic constituencies hold, that sentence (6c) is obtained from (6a) by verb movement to an edge or perhaps from (6f) by object movement to the right edge, whereas sentence (6e) rises from (6a) by object movement to the front edge.

- (6) a. Marko voli Vesnu. (SVO)  
 Marko.NOM loves Vesnu.ACC  
 'Marko loves Vesna.'
- b. Marko Vesnu voli. (SOV)
- c. Voli Marko Vesnu.
- d. Voli Vesnu Marko. (VOS)
- e. Vesnu Marko voli.
- f. Vesnu voli Marko. (OVS)

As I will show, in the derivation of sentences with auxiliary clitics, the freedom of word order must be taken into considerations in order to find out the proper input. It is even highly probable that the relaxation of head directionality is due to the necessity to accommodate auxiliary clitics (see below).

### 3.2 The morphological structure of auxiliary verbs

I show that the internal structure of the auxiliary verbs (*biti* 'to be' and *hjtie* 'to want') is the source of the Wackernagel effect. The reason is that the full forms in the relevant conjugation is the concatenation of two independent morphemes, and in addition one of the morphemes, the intended clitic, is  $\omega$ -specified, a feature which owes them to have scope, just like *wh*-operators and negation. Consider the conjugation of the present imperfective of the auxiliary verb *biti*. As can be seen in (7), each clitic form results from the suppression of a syllable of the corresponding full form. Interestingly, the clitic is the second syllable for all persons but the 3<sup>rd</sup> singular. Immediately, one can relate this fact to the peculiarity of the clitic *je*, which parts from other auxiliaries in the clitic cluster, (8), in that it is the rightmost in the cluster, in alternation with the reflexive *se*.

(7) **Present imperfective of *biti* 'to be'** (adapted from Mihalicek)

	Singular	Plural
	clitic / full	clitic / full
1 <sup>st</sup>	sam / <b>jesam</b>	smo / <b>jesmo</b>
2 <sup>nd</sup>	si / <b>jesi</b>	ste / <b>jeste</b>
3 <sup>rd</sup>	je / <b>jeste</b>	su / <b>jesu</b>

(8) **Clitic order**

*li* > {auxiliaries except *je*} > dative > accusative > genitive > { *se* > *je* / *je* > *se* }

Assuming the x-slot theory of the skeleton (cf. McCarthy 1979, 1981; Kaye and Lowenstamm 1984, Levin 1985, etc.), I would like to suggest that each pair clitic/full form is underlyingly a bimorphemic representation in which one morpheme has a floating melody, i.e. not associated to the skeleton. Let us take the floating melody to be the non-clitic part of the compound. For instance, the representation of the first and third person imperfective present of *biti* is as given in (9a,b) respectively.

- (9) a.        j e s a m        b.        j e s t e        c.        j e s a m        d.        j e s t e  
               / / /                \ \                / / / /                | \ / \ / \ /  
               x x x x x                x x x x x                x x x x x                x x x x x

Now one can rely on a simple rule associating the melody to the skeleton, consistently with standard assumptions in non-linear morphology and phonology, to obtain the full form (9c,d). I will assume that this rule takes place in the morphology (thus prior to the syntactic derivation). However, to use the clitic form, the grammar must get rid of the floating melody, as well as its unused skeletal slots. This could be realized with what is usually referred to as a stray erasure rule. It is natural to assume, however, that such a rule cannot operate on words, for each person in the conjugation is a lexical entry. I claim that the grammar has recourse to a special strategy: the mandatory adjunction of the auxiliaries to any appropriate element in order to jettison the unwanted morpheme. On this view, if an auxiliary is not adjoined the derivation will crash. In the next section, we will see how the stray morpheme come to be filtered out by adjunction.

Before developing this proposal, it should be stressed that pronominal clitics do not show the pattern just discussed. The paradigm in (7) exhibits a perfect regularity, except for one person. This is different from the pronominal paradigm which has clitics only in accusative, dative, and genitive (cf. Table 1). In addition, there are multiple gaps and irregularities in these three cases. Indeed, the first and second person plural of genitive and accusative show no distinction between strong forms and reduced forms, as a single morpheme is used, *nas* for 1<sup>st</sup> person and *vas* for 2<sup>nd</sup> person. Also, the dative reduced form follows a different formation pattern from the accusative and the genitive: *mi* (*m...i*) and *ti* (*t...i*) are the clitics for *meni* and *tebi* respectively, whereas in the accusative one as *me/mene* and *te/tebe*, similar to the auxiliary pattern. Since this paradigm is disparate, as certain morphemes exhibit an unpredictable shape, I conclude that the pronominal clitics are not derivable from the full forms and therefore constitute independent lexical entries (see footnote 7).

	<b>Full form/Clitic</b>					
	<b>1<sup>st</sup> sg.</b>	<b>2<sup>nd</sup> sg.</b>	<b>3<sup>rd</sup> sg, (m, f, n)</b>	<b>1<sup>st</sup> pl.</b>	<b>2<sup>nd</sup> pl.</b>	<b>3<sup>rd</sup> pl.</b>
<b>genitive</b>	mene/ me	tebe/ te	njega/ga, nje/je, njega/ga	<i>nas</i>	<i>vas</i>	njih/ih
<b>dative</b>	meni/ <i>mi</i>	tebi/ <i>ti</i>	njemu/mu, njoj/joj, njemu/mu	nama/ nam	vama/ vam	njima/ <i>im</i>
<b>accusative</b>	mene/ me	tebe/ te	njega/ga, nje/je, njega/ga	<i>nas</i>	<i>vas</i>	njih/ih

**Table 1.** Paradigm of pronominal clitics<sup>3</sup>

### 3.3 Move or die

I claim that auxiliary clitics must be settled by movement. Specifically, they must get rid of the deficient morpheme, otherwise the derivation will die with them. This case of absolute necessity leads the grammar to grant such elements a safe-conduct that allows them to be set up before other elements can move to satisfy their own constraints. The input structure has to be aptly generated for movement to take place as soon as possible. To warrant this outcome, it might be the case that the grammar relaxes head directionality for major components of the sentence, hence the extreme freedom of word order. Thus, from any input structure, a suitable head (recall footnote 1), one that can be reached without incurring a constraint violation, must be (made) available. The constraints at work here are the Well-formedness condition on movement (10), and the obligation for these auxiliary clitics to move to the highest possible element, given the assumption that they are  $\omega$ -specified (vector). The fact is that these scope greedy elements take the opportunity to acquire widest scope by picking up the highest host in the structure. In addition they are subject to Vector Effect, which is conveniently renamed after the Chomskyan principle, (11), since both are similar in principle.

(10) **Well-formedness condition on movement**

No string-vacuous movement is allowed. That is, a moved element must skip another element.

(11) **Superiority condition**

Vectors in the same domain are not commutable by rule of movement:

$$[V^1 \dots V^2] \rightarrow * V^2 [V^1 \dots t]$$

<sup>3</sup> Adapted from [https://en.wikipedia.org/wiki/Serbo-Croatian\\_grammar](https://en.wikipedia.org/wiki/Serbo-Croatian_grammar).

Given the freedom of word order in SC, several different inputs may yield the same output. However, under the natural assumption that the grammar is built on some principle of economy, useless derivations are avoided whenever a simpler input exists. Consider the sentences in (12), after Čamdžič and Hudson (2007).<sup>4</sup> As can be seen, the auxiliary clitic appear in second position after the first word or the first constituent, but not in first and third position, where in my view it is in situ.

- (12) a. Ivan **je** poljubio svoju baku.  
       Ivan AUX kissed his grandmother  
       'Ivan has kissed his grandmother.'
- b. Poljubio **je** Ivan svoju baku.
- c. Svoju baku **je** Ivan poljubio.
- d. \***Je** poljubio svoju baku.
- e. \*Ivan poljubio **je** svoju baku.

It should be noted by the way that in the present theory the syntactic structure is built by successively merging heads and complements, which enter the derivation with their morphological features, and eventually their phonological deficiency as well. There are neither abstract functional elements nor abstract components like PF in current generative theory.

From this perspective, one can posit that the derivation of (12b) and (12c) proceeds from an input like (13a), where the symbol '~' indicates a compound with an ill-morpheme, as discussed above. The auxiliary must move to another element in order to break its compound, but there is no suitable host in this input. Indeed, it cannot adjoin to the adjacent subject, given the ban on string-vacuous movement; neither can it move down to a lower element, the verb or the object, for scope reason. Rather, either the verb or the object may become a host by moving to the left edge of the structure, as seen in (13b). From either of the structures in (13b), the auxiliary adjoins to the fronted element, yielding the desired results, (13c), in three derivational steps.<sup>5</sup> (The equal sign is used to indicate adjunction to which I turn immediately.)

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4 Actually example (12a) is not to be found in Čamdžič and Hudson (2007). I assume that it is possible after comparing it with the following example they provide (their (43)):

(i) Ivana je napravila kolače.  
       Ivana.nom is made cakes  
       'Ivana has made some cakes.'

5 Notice that once an element is moved, it leaves no trace and therefore its branch is assumed to be cut out of the tree structure. In subsequent steps, internal constituents need not be shown; the brackets are used to indicate edge-adjunction.

- (13) a. [ Ivan [[*je~ste* poljubio] svoju baku] ] (input)  
 b. poljubio [ Ivan *je~ste* svoju baku] / svoju baku [ Ivan *je~ste* poljubio]  
 c. poljubio=*je* Ivan svoju baku / svoju baku=*je* Ivan poljubio (output)

Before turning to (12a), let us see how the auxiliary comes to be set up by adjunction. The representation of the verb initial structure in (13c) is given in (14), where conveniently only relevant x-slots are shown. As can be seen, this type of adjunction, referred to as temporal adjunction, consists in linking the leftmost skeletal position of the moved element with the rightmost one of the host with a line. Let us suppose that the grammar acts as a cursor pointing successively to the x-slots, and that the validity of every segment is checked before the word can be spelled out. Let us assume that a segment is valid if and only if its melody is linked to an x-slot. Then pointing to the first x-slot of the initial timing tier, that of the segment *p* of *poljubio*, the cursor flows through each x-slot, and goes down to the adjoined clitic via the association line (relevant x-slots are underlined). After reaching the vowel of *je*, it jumps to the first x-slot of *Ivan*, ignoring the bare skeletal slots as garbage. As a result, the second part of the auxiliary compound goes missing in the output. This analysis predicts that any other clitic that adjoins to *je~ste* will disappear with *ste* (see below).

- (14)
- |                         |                     |
|-------------------------|---------------------|
| Poljubio                | [ Ivan svoju baku ] |
|                         |                     |
| ... <u>X</u>            | <u>X</u> ...        |
|                         |                     |
| <u>X</u> <u>X</u> x x x |                     |
| /                       |                     |
| j e s t e               |                     |

Consider now (12a). It rises from an SVO input in which the verb and the auxiliary are inverted, as in (15a). The auxiliary compound moves across the verb and adjoins to the subject, yielding the correct output (15b). The fact that the auxiliary may be generated after the participle verb is not surprising, given the assumption that head directionality is relaxed in the input as long as basic constituencies are respected. Moreover, the relaxation of the head-complement order is driven by the need to allow the emergence of the auxiliary clitic, which must move anyway or else it dies with the derivation. Here the derivation stops as soon as the clitic is adjoined., neither the parti Indeed ciple nor the object can move, as shown in (16).

- (15) a. [ Ivan [[poljubio *je~ste*] svoju baku] ] (input)

- b. Ivan=*je* [poljubio svoju baku]
- (16) a. \*poljubio [ Ivan=*je* svoju baku]
- b. \*svoju baku [ Ivan=*je* poljubio ]

However, it is possible to use the aux-participle order in an SVO input if the subject is a constituent, as in (17) (cf. Mihalicek 2012: 195). The sentence in (17b) rises from a participle-aux input, where the clitic moves across the verb. In (17a), on the other hand, *sestra* is not a possible host, but the clitic can acquire non-vacuously the possessive determiner (see section 8 below).

- (17) a. Moja *je* sestra došla. (input: [Moja sestra [je došla]])  
 my.NOM is sister.NOM arrived  
 ‘My sister arrived.’
- b. Moja sestra *je* došla. (input: [Moja sestra [došla je]])

I have shown that auxiliary clitics do not look for the second position, which does not have any theoretical relevance. Rather, they seek to adjoin to a suitable element that meets their scope requirement. To have the widest scope, they merge with the first element in the structure.

#### 4. Clitic cluster

##### 4.1 The composition of the cluster

SC clitics are rigidly ordered within a cluster. Pronominal clitics must follow auxiliary clitics, except *je*, in the following order: dative>accusative>genitive (cf. Čamdžić and Hudson 2007, among others). Since the clitics move to make up a cluster, it is a matter to find out where they come from, i.e. their original position in the input. In an SVO input, it is natural to assume that the order is either dative-accusative or accusative-dative. Which of these orders is active in a given language depends on the distribution of features in the paradigm and the Animacy Hierarchy (AH), which forces the computation of the dative argument (animate) before the theme. In Italian, Romanian, and Spanish, the order is dative-accusative, consistently with the AH, while in French, which does not use this constraint, both orders are found (though not freely), as shown below:

- (18) a. Marie le lui donne.  
 M. it.ACC him.DAT gives

- 'Marie gives it to him.'
- b. Marie te le donne.  
M. you.DAT it.ACC gives  
'Marie gives it to you.'

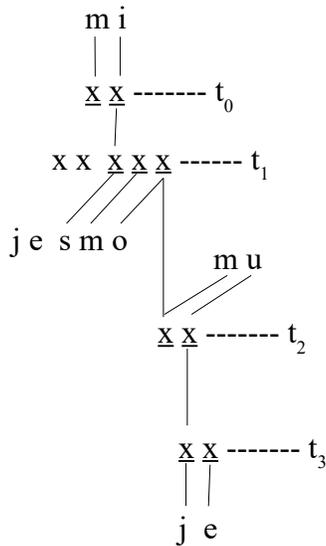
The ordering of the clitics with respect to imperative verbs normally reflects that of the input since movement is usually not possible in this subjectless mood. In SC it appears that the order of the arguments is dative-accusative in imperative constructions. Therefore, I assume that in the input the clitics are generated in such an order. (I must ignore the genitive here, which is absent in the available literature.) In addition, argumental clitics are subject to the OCP, but unlike auxiliary clitics, if they fail to exit the VP in certain contexts, the derivation may not crash since they are not compound. Therefore, one may expect them to stay in situ, as is the case with imperative verbs.

Consider the sentence in (19) (cf. Bošković 2004). It can be derived from an SVO input in which the auxiliary follows the participle, as shown in (20a). The auxiliary compound moves to the subject in order to be set up (see below). It is followed by the dative and the accusative clitics, which successively add to the cluster in one derivational step, (20b).

- (19) a. Mi smo mu je predstavili juče.  
we are him.dat her.acc introduced yesterday  
'We introduced her to him yesterday.'
- (20) a. [Mi [[[predstavili *je~smo*] mu] je] juče] (input)  
b.  $Mi=smo=mu=je$  [predstavili juče] (output)

This auxiliary clitic patterns differently in that the crippled morpheme is on its left side. If it is assumed that an association line can radiate only from a valid x-slot, the leftmost segment of *smo* can acquire the rightmost segment of *mi* with an association line to realize the adjunction. Then the first argumental clitic adjoins to the auxiliary and becomes the host for the second, as shown in (21). Each clitic appears on its own tier so that a complex compound spanning on four timing tiers,  $t_0$  to  $t_3$  obtains. The linearization starts from the first segment of the original tier, flows forward then down through each secondary tier via the association line, with no zigzag. Just like in the case of *je*, the first part of the compound disappears during the linearization process since it is not even in the path of the cursor.

(21)



Under this analysis, the auxiliary must be at most the third element in the input structure, so that its leftward movement takes place across another element, consistently with the ban on string-vacuous movement. In fact, the auxiliary clitic may be generated in the first position in the input, in which case it has to undergo a rightward movement to the next element. Given the mechanics of adjunction, a rightward movement cannot be vacuous. Consider the sentences in (22) (cf. Schütze: 27). The pro-drop sentence (22b) rises from (23a), where the auxiliary moves rightward to the participle, while the other clitics remain in situ by the ban on string-vacuous movement.<sup>6</sup> The fact that the other clitics do not move is not surprising since they do not carry the same deficiency as their auxiliary counterparts. As for sentence (22a), it is derived from input (23b) (the left side of the arrow); the auxiliary adjoins to *ja*, and then all argumental clitics move successively to the new-formed syntactic compound so that the closest to the target, the dative, is placed first.

(22) a. *Ja sam mu ga dala.*

I aux me it given

'I gave it to him.'

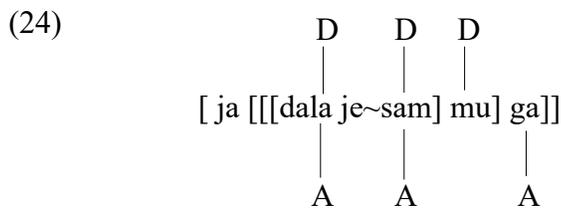
b. *Dala sam mu ga.*

(23) a.  $[[[je\sim sam\ dala]\ mu]\ ga] \rightarrow dala=sam\ mu\ ga.$

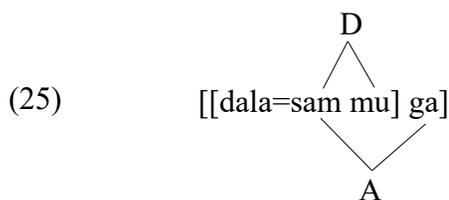
b.  $[ja\ [[[dala\ je\sim sam]\ mu]\ ga]] \rightarrow ja=sam=\mu ga\ dala.$

<sup>6</sup> In fact, an alternative derivation with the input  $[ja\ [[[je\sim sam\ dala]\ mu]\ ga]]$  may be felicitous if the auxiliary moves rightward to the verb, whereas the subject is dropped to cancel the resulting loss of scope. If from such an input the verb were fronted instead, one would obtain the following output  $(?)dala=sam=\mu ga\ ja$ , on which I have not found any judgment in the available literature.

Consider now the question why the argumental clitics ever have to move to become part of the host-auxiliary compound. In the non-linear representation of input (23b), as given in (24), the verb and the auxiliary bear the same case features, dative and accusative, like the clitics. So each clitic pairs up with the relevant case of the complex aux-verb, which heads two domains. Normally this configuration is forbidden in natural languages by the OCP. Thus, to avoid this constraint, argumental clitics must exit the VP, just like their Romance counterparts (cf. Desouvrey 2000, 2005, 2018, 2019). What is specific to SC here is that the auxiliary must be set up first, a requirement which is realized here by its adjunction to *ja*.



In (22b) however, there is no escaping domain, just as in imperative verbs. Thus, what happens is exactly what the OCP is intended to avoid, namely a morpheme build up by case fusion in the complement domain of the verb. Indeed, identical cases are merged, yielding a configuration like (25). If this configuration were universally allowed, i.e. if universal grammar did not use the OCP, all verb-clitic structures would be reanalyzed as a compound, a result which would have unwanted consequences elsewhere in the grammar.



#### 4.2 The late placement of *je*

Being the first element of its compound, it may not be surprising that clitic *je* is placed at the end of the cluster. The reason is that if another element were to be adjoined to *je*, it would attach to the rightmost bare x-slot of the defective morpheme *ste*, and at the linearization the cursor would not reach it, resulting in its disappearance. This is illustrated with the following ill-derivation (Bošković 2004:54), where the clitics *mu* and *ga* have gone missing with their deficient host *~ste*:

- (26) a. [ona [[[ predstavila *je~ste*] *mu*] *ga* ]] (input)  
 b. \*ona= *je~ste=mu=ga* predstavila → ona=*je* predstavila

To the extent that lexical elements may not in general be lost in the derivation, it is self-evident that the placement of auxiliary *je* must be postponed after all other clitics. So the peculiarity of this clitic need not be stipulated by the grammar, as it follows from the representation. As I will show shortly, the reflexive *se* has the same internal structure as auxiliary *je*, and therefore its placement must be postponed as well. However, the placement of *je* need not be postponed when interacting with  $\omega$ -specified elements. As I will show, vectors are attracted to each other, and therefore they will never attach to the neutral defective *ste*.

Let us turn now to two additional facts involving *je*. In a cluster with the reflexive clitic, both orders are possible: *se>je* and *je>se*. In addition, *je* may be dropped in this type of cluster. This is illustrated in (27) and (28) (adapted from Mihalicek 2012: 281).

- (27) a. Ana *se* vidjela.  
 Ana.NOM SELF seen  
 'Ana saw herself.'  
 b. Ana *se je* vidjela.
- (28) a. Ana *ga se* bojala.  
 Ana.NOM him.ACC SE be-afraid  
 'Ana was afraid of him.'  
 b. Ana *ga se je* bojala.

It is mentioned in the literature that *se* has a dual nature in SC: it may be either a reflexive of the subject, as in (27), or an inherent part of the verb, (28). It is also noted that only the reflexive *se* has a non-clitic form, *sebe*. If my own observation is right, a further characteristic of this reflexive is that it does not agree in person with the subject. That is, its shape is invariable whether the subject is first, second or third person. This fact suggests that it may not belong to the paradigm of personal pronouns, which carry a person feature. This leads to the assumption that the reflexive constitutes a different paradigm, of which it is perhaps the only element. Since it has a full form, it must be the case that it patterns like auxiliaries, that is, it is underlyingly a compound, *se~be*, from which a clitic is derived by mandatory adjunction in the syntactic derivation. A further assumption is needed: both morphemes of this compound must be  $\omega$ -specified so that it is a neutral element in the syntactic derivation, the reason

for which will become clear shortly. Finally, the fact that it carries the stray morpheme on its right side, just like *je*, ensures its placement after the other clitics, and therefore it should compete with auxiliary *je* for the same position in the cluster.

From this perspective, one can derive the sentences in (27b) from the derivation shown in (29). (From now on, each operator bears a superscript indicating their relative rank in the structure; *se~be* is a compound vector, so both of its morphemes have the same number). Given its credentials with pronominal clitics, auxiliary *je* may let the reflexive move first to *Ana*, and then it adjoins to the cluster. Since both morphemes *se* and *be* of the reflexive are  $\omega$ -specified, the auxiliary can be attracted to either (see footnote 8): if it adjoins to the first morpheme *se*, sentence (29b) obtains, but if it adjoins to *be*, it will be filtered out as stray (29c).<sup>7</sup>

- (29) a. [Ana [[vidjela *je*<sup>1</sup>~*ste* ] *se*<sup>2</sup>~*be*<sup>2</sup>]]  
 b. Ana=*se*=*je* vidjela  
 c. Ana=*se*~***be***=***je*** vidjela → Ana=*se* vidjela

As mentioned in the literature, clitics *se* and *je* are competing for the same slot so that the following order is possible as well: *je*>*se*. This is not surprising since both clitics must be set up by adjunction. Thus, from input (29a) the auxiliary may move first instead of the reflexive, yielding *Ana*=*je*=*se* *vidjela*, presumably a well-formed sentence. However, unlike (27a), the omission of the reflexive is not possible: \**Ana je vidjela*. This is consistent with the assumption that *se~be* is omega-specified. In effect, since such elements attract each other, *se~be* will always anchor to vector *je*, but not to the stray ~*ste*, which is neutral.

As for the sentences in (28) with an inherent *se*, they can be similarly explained under the simplest assumption that there is just one clitic *se*, whose full form is never used in non-reflexive contexts. This is more appealing than positing the existence of a homophone inherent *se* since after all these very alternations are regularly observed in both types of construction, reflexive or not. Now the relevant question is why the full form cannot be used in non-reflexive contexts. Obviously, *se~be*, must be taken

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<sup>7</sup> Schütze, after Browne 1975, reports that in spoken language the clusters *me je* and *te je* are similarly reduced to *me* and *te* respectively. It appears thus that in such speeches these pronouns, *mene* and *tebe*, are aligned with *se~be*, i.e. they are reanalyzed as *me~ne* and *te~be*. This is not surprising since they are among the few that show a regular pattern in their paradigm (cf. Table 1). In addition, he reports that the vowel of *se* may be lengthened by certain speakers, i.e. *se* → *se:*. In my opinion, this lengthening is used by the grammar to 'ratify' the loss of the auxiliary instead of ruling out the sentence. In effect, this loss amounts to a constraint violation and normally should not occur, for after all the placement of *je* is postponed precisely to avoid this problem with pronominal clitics. This phenomenon is similar to the pitch accent that appears on clitic *le* in French imperatives, where the OCP violation is inevitable. In normal speeches, *le* → *l*, as in *on le prend* [õl prã] 'we take it', but one has: *prends-le* 'take it!' instead of \**prends-l*! (cf. Desouvrey 2000).

as part of the lexical entry of certain verbs (the inherent-*se* verbs), and as such it directly enters the syntax in an idiom phrase. Quite contrary, the reflexive is called as a complement by a syntactic head, which may or may not require it to pass by the morphology before entering the syntax. That is, if the head requires a full form, *se~be* must be set up in the morphology, otherwise it directly enters the syntax, where it has to be set up by adjunction.

To conclude, the special behavior of *je* and *se* is accounted for in a principled way. A further interesting fact is the possibility for *je*, unlike other auxiliary clitics, to be the first element of the sentence. This occurs in *yes-no* question with *li*, which will be addressed in section 7. In the next section, I will show that the interaction of auxiliaries with *wh*-operators strongly supports the present analysis.

### 5. Interaction of auxiliaries with *wh*-arguments

*Wh*-elements are specified for various features, including case. Their morphology does not consist of a stem to which a case morpheme is affixed, just like their pronominal counterparts. Therefore, they must be treated as clitics. In French for instance, each pronominal clitic has a caseless strong form which behaves like an NP. This is the same for argumental operators: their strong form must stay in situ, unlike the clitic equivalent. This is illustrated in (30).

- (30) a. Il fait quoi? / \*Quoi fait-il ?  
           he does what  
           'What does he do?'  
       b. Que fait-il? / \*Il fait que?  
           What does he  
           'What does he do?'

*Wh*-movement is an interesting matter in SC. In simple clauses, it looks as if there is no superiority effect, as such elements are freely ordered with respect to one another. Rudin (1988) argues that the Superiority Condition does not hold in SC, but her arguments are rejected by others using the same framework (cf. Bošković 1997). In this feature- and constraint-based theory, it amounts to say that *wh* in SC are not specified for  $\omega$ , a feature that confers scope to its bearer. It is unlikely that this is the case since this feature, which may be found in other grammatical categories, is inherent to *wh* and negation. However, what is surprising is the lack of the feature  $\pi$ , which is typical of *wh*-paradigms. It is this feature that forces them, in languages like English and French for instance, to move to an edge of the

structure instead of adjoining to the first element out of the OCP domain, like ordinary argumental clitics. It might be that the dismissal of this feature is an effect of the safe-conduct granted to the auxiliaries.

I argue that *wh*-elements in SC can be reordered during the course of the derivation without inducing a superiority effect. This is due to the very nature of vectors, which are directional and scopal elements. If a structure contains more than one vector, there is what may be called a potential difference between them. This energy triggers the attraction of the lower vector to the higher one. When the potential difference is null, as is the case under compounding, whether by morphological affixation (+) of temporal adjunction in the syntax (=), their  $\omega$ -feature can be said to be inert. For ease of exposition, I will refer to this effect as the Product of Vectors:

(31) **Product of Vectors**

The cluster (noted  $\circ$ ) of any number of vectors results in the inertness of their  $\omega$ -feature:

$$\vec{A} \circ \vec{B} \circ \dots \rightarrow A \circ B \circ \dots$$

Consider the sentences in (32) (Bošković 1997, Mihalicek 2012), which show an apparent reordering of the operators *ko* and *koga*. In the present analysis, it includes three operators since the auxiliary is a vector as seen above. Sentence (32a) rises from input (33a), where *je* adjoins to the subject operator, and then *koga* adjoins to *je*. The operators in the cluster lose their vector properties by virtue of (31). This is indicated by the absence of their superscript in the output. As for (32b), it proceeds from input (33b), in which the auxiliary is not in a position to move, given the ban on string-vacuous operation. This input is thus improved by the fronting of the last operator in a second step. Despite the transitory superiority effect, this movement is possible under the safe-conduct of the auxiliary. Thus, the auxiliary moves to the fronted operator; as a result, there is no superiority effect since only one valid operator remains in the output.

- (32) a. Ko je koga vidio?  
           who is whom seen  
           'Who saw whom?'  
       b. Koga je ko vidio?

- (33) a. [ $Ko^l$  [[vidio  $je^2$ ]  $koga^3$ ]]  $\rightarrow$  ko=je=koga vidio  
       b. [ $Ko^l$  [[ $je^2$  vidio]  $koga^3$ ]]  $\rightarrow$   $koga^3$ [ $ko^l$  [ $je^2$  vidio]]  $\rightarrow$  koga=je  $ko^l$  vidio

As evidence for this analysis, consider the following variations of a single sentence, (34), which includes three *wh*-operators and the clitic *je* (cf. Mihalicek: 309). In my view, there are four vectors in these sentences. I argue that they show no superiority effect since they originate from different inputs. Recall that the relative order of vectors in the input must be the same in the output. However, in the course of the derivation, vectors may become disabled by adjoining to one another, consistently with (31). In a language where head directionality is almost absent, one expects that only basic constituencies be respected, as discussed above. So, if the verb has two internal arguments, one may have either a [[VO]O], an [[OV]O] or an [O[OV]] structure. Given the requirement that the dative argument must precede the theme and the fact that auxiliaries are vector, one may add two further restrictions on the input: (a) the dative argument must be merged first with the head, and (b) directionality must be respected when both the head and its complement are vector. The logic of this assumption is that vectors are so avid for scope that they may not place a vector complement in a higher position than themselves. Nevertheless, I assume that locality need not be respected with operators so that either argument may move first so long as no superiority effect results in.<sup>8</sup>

- (34) a. ko je kome šta dao?  
       who.NOM is who.DAT what.ACC given  
       'Who gave what to whom?'  
       b. ko je šta kome dao?  
       c. Kome je ko šta dao?  
       d. Kome je šta ko dao?  
       e. Šta je kome ko dao?  
       f. Šta je ko kome dao?

Thus, (34a) and (34b) rise from the derivation shown in (35a) and (35b) respectively. The clitic *je* moves to the first operator, followed by the other operators. As a result, a cluster of four elements is obtained in two derivational steps (35a). Recall that vectors are not at risk to disappear as stray with the defective morpheme *~ste* since they are attracted to the vector part of the auxiliary compound, unlike pronominal clitics. Alternatively, if the fourth operator moves right after the auxiliary, a third

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8 This assumption is derivable from the general properties of vectors. The potential difference between the  $\omega$ -feature of the cluster *ko=je* and the  $\omega$ -feature the lower vectors is one-to-one, so that the lower  $\omega$ -features are competing to pairing up first with the higher  $\omega$ -feature. It must be the case that a lower operator has priority of movement when its  $\omega$ -feature randomly wins the alignment with the  $\omega$ -feature of the cluster.

derivational step is required to add the third operator to the cluster (35b). The reason is that once the fourth operator has moved, the process cannot go back to a higher element, *kome*, in the same step. Similarly, (34c,d) can be obtained from the derivation (35c), which is different from (35a,b) in that the order is aux-participle in the input. Since the auxiliary cannot move immediately, the third operator is fronted. This gives rise to a second step, since the the process cannot go back to adjoin the auxiliary in the newly available position. Once the auxiliary is set up, either the fourth operator adjoins to the subject operator, yielding the output (35d), or it adjoins to the auxiliary cluster, (35e). In the first case, all operators are inert, while in the second case the subject is still a valid operator.

- (35) a.  $[ko^l [[[dao\ je^2\sim\ ste] kome^3] \check{s}ta^4]] \rightarrow ko=je=kome=\check{s}ta\ dao?$   
 b.  $[ko^l [[[dao\ je^2\sim\ ste] kome^3] \check{s}ta^4]] \rightarrow ko^l=je^2=\check{s}ta^4\ dao\ kome^3 \rightarrow ko=je=\check{s}ta=kome\ dao?$   
 c.  $[ko^l [[[je^2\sim\ ste\ dao] kome^3] \check{s}ta^4]] \rightarrow kome^3 [ko^l\ je^2\sim\ ste\ dao\ \check{s}ta^4]$   
 d.  $kome=je\ ko=\check{s}ta\ dao?$   
 e.  $kome=je=\check{s}ta\ ko^l\ dao?$

In the same vein, sentences (34e,f) can be derived from the input for (34c,d) in which the lowest operator is required to move instead of the third to accommodate the auxiliary. Once the latter is set up, the third operator can either adjoin to the cluster or the subject, as shown in (36).

- (36)  $[ko^l [[[je^2\sim\ dao] kome^3] \check{s}ta^4]] \rightarrow \check{s}ta^4 [ko^l\ je^2\sim\ dao\ kome^3] \rightarrow$   
 $\check{s}ta=je=kome\ ko^l\ dao? / \check{s}ta=je\ ko=kome\ dao?$

To conclude, we may note that this analysis is only possible in a theory that is based on feature interaction. The inherent property of any lexical element must be related to some feature that can be tracked down. Theories which do not consider that the scope of an operator is due to a feature cannot capture the correlation between the auxiliaries and the *wh*-operators. Two features are essential to this analysis: the feature  $\omega$ , which is normally found in operators and accidentally in SC auxiliaries, and the lack of the feature  $\pi$  in SC *wh*-operators. It is this missing feature which allows them to cluster together.

## 6. Clitic climbing

I show that the phenomenon of clitic climbing can be thoroughly accounted for under the assumptions made above, namely the lack of head directionality for major constituents of the sentence, and the major role of the  $\omega$ -feature. Certain aspects of the analysis to be presented here will be used to tackle the syntax of interrogative *li* in the next section. Consider for instance the seven variants of a sentence

in which the complement of the main verb is an infinitive with two arguments, a clitic and an NP, as shown in (37), adapted from Mihalicek (2012: 420-421). The matrix verb (*ho~će*) is an  $\omega$ -clitic which is obtained from the full form by inbound movement and adjunction, just like the other auxiliaries. A further assumption (not crucial for these data) I have to make here is that infinitive verbs in SC are specified for  $\omega$ , and therefore they are sensitive to superiority effect, for which evidence will be provided shortly.

- (37) a. Ana *će* poslati *ga* Marku.  
 Ana.NOM will send.INF it.ACC Marko.DAT  
 'Ana will send it to Marko.'
- b. Ana *će ga* poslati Marku.  
 c. Ana *će ga* Marku poslati.  
 d. Posla*će ga* Ana Marku.  
 e. Posla*će ga* Marku Ana.  
 f. Marku *će ga* Ana poslati.  
 g. Marku *će ga* poslati Ana.

In (37a) the pronominal clitic remains in situ, in the infinitive phrase, whereas in (37b-g) it is in a cluster with the auxiliary, which is hosted by either the subject, the infinitive verb or the second object. I claim that (37a) is different from the other variants in that it originates from an input like (38a), which is made of two island structures, i.e. non physically part of the same tree structure. Therefore, it must be the case that the vectors are not ordered with respect to one another. Nevertheless, both structures are linked by coreference since the subject of the matrix clause controls the infinitive verb. The neutral accusative clitic is in situ, as it is normally computed as the first argument of the verb, a priority it owes to its cliticness. Thus, the matrix verb is set up by adjoining to the subject, while the pronominal clitic remains inside its own structure, as seen in (38b). Under the two-structure analysis, the pronominal clitic cannot exit the VP, whose elements have to be in their default order, VOO. Any other ordering is ill-formed, as seen in (38c,d). There are at least two possible reasons for this. In one hand, the vectors still attract each other despite their insularity, and on the other the infinitive wants to prevent the auxiliary from taking scope over its arguments.

- (38) a. [*ho~će*<sup>l</sup> Ana] [[*poslati*<sup>l</sup> *ga*] Marku] (input)  
 b. Ana=*će*<sup>l</sup> [[*poslati*<sup>l</sup> *ga*] Marku] (output)

- c. \*Ana=*će*<sup>1</sup> [Marku [*poslati*<sup>1</sup> *ga*]]  
 d. \*Ana=*će*<sup>1</sup> [Marku [*ga poslati*<sup>1</sup>]]

In the other sentences, (37b-g), the clitic has climbed out from the infinitive clause to the auxiliary clause. Mihalicek points out: “if the infinitive’s clitics climb out to the matrix clause, the infinitive itself and any of its non-clitic arguments are just treated as ordinary main clause arguments and can freely reorder with respect to them.” (p. 283). Thus, they may not rise from a two-structure analysis. I assume that the sentences (37b-g) originate from single-tree structure inputs, where reordering takes place under the safe-conduct of the auxiliary. Thus, (37b) proceeds from the SOV input (39a), where the object is VOO. The auxiliary moves to the subject, (39b), and then the clitic exits the VP as seen in (39c). Notice that there is no superiority effect since the auxiliary originates out of the infinitive clause and moves across it. As for sentence (37c), it results from a similar derivation, except that the infinitive object has to be in an OOV order.

- (39) a. Ana [[*poslati*<sup>1</sup> *ga*] Marku] *ho~će*<sup>2</sup>  
 b. Ana=*će*<sup>2</sup> [[*poslati*<sup>1</sup> *ga*] Marku]  
 c. Ana=*će*<sup>2</sup>=*ga* [*poslati*<sup>1</sup> Marku]

Let us turn now to (37d) and (37e) in which the clitic cluster is affixed to the infinitive verb. I suggest that they rise from the derivations shown in (40) and (41) respectively. From (40a), an SVO input, the infinitive paves the way for the auxiliary by moving to the left edge of the structure, as seen in (40b). Thus the auxiliary and then the pronoun move to the infinitive, yielding the correct output (40c). On the other hand, from the VOS input in (41a), the auxiliary directly moves to the infinitive verb, resulting in the disablement of their  $\omega$ -feature; the clitic *ga* remains in situ, as it is already adjacent to the cluster, as shown in (41b).

- (40) a. [Ana [*ho~će*<sup>1</sup> [[*poslati*<sup>2</sup> *ga*] Marku]]] (input)  
 b. *poslati*<sup>2</sup> [Ana [[*ho~će*<sup>1</sup> *ga*] Marku]]  
 c. *posla=će=ga* Ana Marku (output)
- (41) a. [[ *ho~će*<sup>1</sup> [[*poslati*<sup>2</sup> *ga*] Marku]] Ana] (input)  
 b. *posla=će ga* Marku Ana (output)

The assumption that the infinitive verb is a vector is supported by its shape in the cluster. Indeed, it surfaces as *posla=će* instead of the expected \**poslati=će*. This alternation is analogous to that of clitics

vs. full forms in the conjugation of the auxiliary verbs. Indeed, both cases are due to the fact that compounds are defective in SC in that the melody of one of the morphemes is floating. Thus, this alternation, which occurs in certain classes of verbs (cf. Mihalicek:191-192), tells us that the infinitive verb is made of an  $\omega$ -specified radical and a neutral infinitive affix, which is weakly linked to the skeleton by a default rule of spreading: *posla~ti*. If in the syntax a vector targets the radical, the spreading rule is presumably dismissed, as its original structural description no longer exists. As a result, the infinitive affix disappears as stray at the end of the derivation. It should be noted that a similar phenomenon occurs in European Portuguese, where pronominal clitics, which are also  $\omega$ -specified, are inserted between the radical and the infinitive ending (cf. Desouvrey 2008b, and references therein). In the light of the present study on SC, this can be further characterized. In Portuguese, the infinitive ending does not disappear because its melody is genuinely attached to the skeleton from the lexicon, whereas in SC it is floating, which triggers a rule of association in the morphology component.

Consider now (37f,g) in which the NP *Marku* is the host of the clitics. Their derivation proceeds from the inputs shown in (42a) and (43a) respectively. The structure (42a) is an SVO input, but the structure of the object VP is OVO. *Marku* is fronted, which lays out an intermediate structure for the auxiliary to set up. Then in the last step, the auxiliary and the pronoun adjoin in turn to *Marku*, as seen in (42b). The derivation (43) proceeds from a VOS input, with the object having the same structure as that of (42). The auxiliary moves rightward to *Marku*, attracting the pronominal clitic, as seen in (43b).

(42) a. [Ana [ $ho\sim\acute{c}e^1$  [Marku [ $poslati^2$  ga]]]]  $\rightarrow$  Marku [Ana  $ho\sim\acute{c}e^1$   $poslati^2$  ga]

b. Marku= $\acute{c}e^1$ =ga Ana  $poslati^2$  (output)

(43) a. [[ $ho\sim\acute{c}e^1$  [Marku [ $poslati^2$  ga]]] Ana]

b. Marku= $\acute{c}e^1$ =ga  $poslati^2$  Ana (output)

To complete the analysis of the paradigm in (37), we may note that the replacement of the NP *Marku* by a clitic reduces the number of variants to only three: either the pronominal clitics remain in situ or else they are all attracted by the auxiliary. In the first case, the auxiliary is aptly generated in sentence initial position in an input similar to that of (37a). Then, it is adjoined to the subject *Ana* by rightward movement, while the infinitive clause remains intact, as seen in (44a). Alternatively, in an SOV input, once the auxiliary is set up, the pronominal clitics can exit the VP, (44b); just in the case discussed above, there is no superiority effect despite the reordering. A third possible derivation

consistent with the present analysis is given in (44c), which is presumably an acceptable sentence.

- (44) a. [ho~će<sup>1</sup> Ana] [poslati<sup>1</sup> mu ga] → Ana=će<sup>1</sup>[poslati<sup>1</sup> mu ga]  
 b. Ana [poslati<sup>1</sup> mu ga] ho~će<sup>2</sup> → Ana=će<sup>2</sup> [poslati<sup>1</sup> mu ga] → Ana=će<sup>2</sup>=mu=ga poslati<sup>1</sup>  
 c. Ana [ho~će<sup>1</sup>[poslati<sup>2</sup> mu ga]]→poslati<sup>2</sup>[Ana [ho~će<sup>1</sup> mu ga]]→ posla=će=mu=ga Ana

It appears that in any construction with a compound tense, the auxiliary must be set up as soon as possible. If it is generated in the second position in the structure, a lower element must be fronted before it can move, given the prohibition of vacuous movement.

### 7. The interrogative particle *li*

The particle *li* is mainly used in *yes-no* questions, where it must be preceded by a tensed verb or another particle, *da*, as illustrated in (45) (adapted from Mihalicek 2012: 297, 299, 303). To correctly analyze such sentences, the status of both particles must be clarified. I will assume that *da* is a complementizer, consistently with a standard assumption in the literature. However, under my assumptions, the complementizer is a referring element, precisely a relative pronoun/anaphor (cf. Desouvrey 2007, 2008a, etc.). In addition, it must be the case that it is a vector, just like the clitics, as I will show. As for the particle *li*, I will argue that it is a referring element, an anaphor and also a pronoun that refers to an event, i.e. a clause, instead of an NP. Furthermore, I suggest that morphologically *li* is a part of a compound, *da~li*, where *da* is a deficient morpheme in the sense discussed above. Just as in the case of the verbal auxiliaries, the resulting full form *dali* is derived in the morphology, while the clitic *li* is set up in the syntactic derivation by adjunction. If this view is correct, it is expected that *da~li*, *dali* as set up in the morphology, cooccur with the complementizer *da*. This is borne out, as can be seen in (46).<sup>9</sup>

- (45) a. Da li Ana spava?  
 DA LI Ana.NOM sleep.3SG  
 'Is Ana sleeping?'  
 b. Da li mu ga je Ana kupila?  
 DA LI him.DAT it.ACC is Ana.NOM bought.3SG  
 'DidAna buy him that?'

9 Schütze (1994) briefly reports that in some literature *dali* is sometimes analyzed as a single word, the full form of the clitic *li*, a view that is rejected by Radanović-Kocić (1988) and Hock (1992), which are not accessible to me at this time.

- c. Spava li Ana?  
 d. Jeste li mi ga poslali juče?  
 are LI me.DAT it.ACC sent yesterday  
 'Did you send it to me yesterday?'

- (46) *Da li da ti dam knjigu?*  
 DALI COMP you give book  
 'Should I give you the book?' (Schütze 1994: 85, citing Browne 1974: 39)

Given these assumptions, one can posit for (45a) the input in (47a). This is a two-structure input: a small matrix clause, the *da* clause, and a complement clause, which is in fact the main clause.<sup>10</sup> For the time being, the indexes descriptively indicate intended coreference: so *Ana* is the antecedent of the complementizer, while the particle *li* refers to the complement clause. It is important to notice that both structures being autonomous, their vectors are not ordered with respect to each other, as indicated by the superscripts. The compound *da~li* adjoins to *da* to be set up, yielding the desired result (47b). Notice that contrary to the case of the infinitive island discussed above, the verb cannot be in the first position of its clause, given that the anaphor *da* must be adjacent to its antecedent *Ana*, just like in ordinary complement clauses cross-linguistically (cf. footnote 10).

- (47) a. [*da~li*<sub>Q</sub><sup>1</sup> *da*<sub>i</sub><sup>2</sup>] [*Ana*<sub>i</sub> *spava*<sup>1</sup>]<sub>Q</sub>  
 b. *da*<sub>i</sub>=*li*<sub>Q</sub> [*Ana*<sub>i</sub> *spava*<sup>1</sup>]<sub>Q</sub>

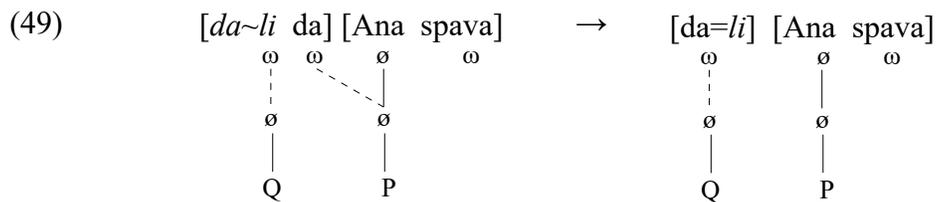
Similarly, the derivation of (45b) proceeds from an input like (48a). The compound *da~li* adjoins to the relative (48b), a process which results in the neutralization of their  $\omega$ -feature. The one-element structure is reanalyzed as an edge-adjoined element, under the safe-conduct of the auxiliary *je*, which must be set up. Thus, this auxiliary yields priority to the pronominal clitics by postponing its placement after them, as seen in (48c).

- (48) a. [*da~li*<sub>Q</sub><sup>1</sup> *da*<sub>i</sub><sup>2</sup>] [*Ana*<sub>i</sub> [[[*je*<sup>1</sup> *kupila*] *mu*] *ga*]]<sub>Q</sub>  
 b. *da=li=mu=ga Ana je kupila*  
 c. *da=li<sub>Q</sub>=mu=ga=je Ana kupila*

---

10 In this view, a sentence like *John thinks that Mary likes him* consists of a matrix clause and a complement clause: [John thinks that]<sub>i</sub>[Mary<sub>i</sub> likes him]. The scope of the latter is restricted by the matrix clause, which is indeed a restrictive relative clause (see Desouvrey 1997, 2003, 2008a, 2010, etc.). The traditional division is a nonsense since none of the clauses can be qualified as independent: \*[John thinks][that Mary likes him].

Before turning to (45c,d), we must take a closer look at the mechanism of coreference, which is actually realized by spreading. The referential representation of the input structure (47a), as given in (49), exhibits the fact that the three types of referring elements, namely NPs, pronouns and anaphors, have a distinct feature-tree representation (cf. Desouvrey 2003, 2006, 2013). Every referential element has a root node, which may be either  $\omega$  (vector),  $\varphi$  (scalar) or  $\emptyset$  (neutral). In addition, the NP and the pronoun, unlike the anaphor, have a class node (a thematic node), which is neutral for nominative and accusative argument. The NP is further specified for a terminal feature,  $P$ , which is the virtualization of a real world entity, while the pronoun bears the feature  $Q$  representing the complement clause. Given the assumption that the particle *li* can be either an anaphor or a pronoun, it must be represented with a floating thematic node, which is linked to the root node via a dotted association line only if a referential feature exists, here  $Q$ . Thus, coreference is then realized by spreading the appropriate feature from one element to another. The pronoun *li* and the NP are referentially autonomous, while the relative anaphor is supplied with a thematic feature by its intended antecedent, the NP *Ana*.<sup>11</sup> Once the compound *da~li* is adjoined to the complementizer, this complex referential pattern is simplified, resulting in the fusion of their root node. The anaphoric relation between *Ana* and the complementizer is thus no longer necessary.



Thus, under this analysis, it appears that *yes-no* questions are made of the conjunction of two clauses, one of which, the matrix clause, is the repetition of the subordinate clause (actually the main clause) via the anaphor/pronoun *da~li*. This may look like strange, but it might be frequently used in natural languages. For instance, colloquial French uses a similar construction to derive exclamative sentences:

- (50)           Ce qu'il est gentil!  
                   CE that he is kind (\*que il → qu'il)

<sup>11</sup> It should be noted that there are further constraints related to the spreading process, among which: the ban on line crossing and feature clash. The latter may happen with an anaphor if its root node is incompatible with that of the R-node (or thematic node). That is, if an anaphor is a vector, it can only target an R-node of another vector or a neutral element (neither vector nor scalar). In addition, a vector anaphor cannot acquire a distant antecedent across another vector. It appears that these constraints are irrelevant here.

'How gentle he is!'

It is easy to see that the input for (50) is similar to (47a) in that it comprises a matrix clause and a complement clause with the same referential scheme, as can be seen in (51a). Notice that in the standard version, the pronoun *ce* is simply deleted, (51b). In SC as well, such a structure can be simplified by deletion of one of the elements in the matrix clause (cf. 45c,d, and below).

- (51) a. [ce<sub>Q</sub> que<sub>i</sub>] [il<sub>i</sub> est gentil]<sub>Q</sub>  
 b. [ee<sub>Q</sub> que<sub>i</sub>] [il<sub>i</sub> est gentil]<sub>Q</sub> (cf. Qu'il est gentil!)

Furthermore, the same *li*-like pronoun *ce* is used in forming modern *yes-no* questions. In current French (but not formal), a dummy matrix clause is used, *c'est que*, which obviates the need for inversion and clitic doubling (see Desouvrey 2007). Compare the formal versions with the normal ones:

- (52) a. Marie est-elle venue? (formal)  
 Marie<sub>i</sub> is she<sub>i</sub> come  
 'Did Marie come?'  
 b. Est-elle venue? (formal)  
 Is she come  
 c. Est-ce que Marie est venue? (normal)  
 CE it that Marie is come  
 d. Est-ce qu'elle est venue? (normal)

Returning to SC, recall that in the result of derivation (49), the anaphoric relation between *da* and the subject *Ana* is dropped. If this view is correct, *da* may not be essential; thus, it should be possible to obtain the same result without using it, if another element is available to host the compound.<sup>12</sup> As it happens, both (45c,d) are indeed well-formed without the complementizer (I will consider shortly the mandatory subject inversion). The representation of (45c) is as given in (53). Once *da~li* is set up by adjunction to the verb, it must be the case that its terminal feature Q is no longer necessary, as it is now an element of the structure Q. Therefore, *li* simply becomes an anaphor to *Ana* at the output.

12 Actually, either *da~li* or *da* can be omitted since they are both pronoun and anaphor. In the following example (Schütze 1994: 85, referring to Browne 1974: 39), it is clear that *da~li* is dropped. Of course, a specific meaning may be attached to each case.

(i) Da **ti** dam knjigu?  
 DA you give book  
 'Should I give you the book?'



superiority effect, then it must be avoided. This can only be realized by the adjunction of *da~li* to the tensed verb ( $\omega$ -specified), so that their  $\omega$ -feature is switched off. In addition, the verb has to be the first element in the structure since a vector may not move to a lower position.

There is a third strategy, apparently marginal, which uses the morpheme *je* as a host for *da~li*, as discussed in Schütze (1994), using data from Radanović-Kocić (1988) and Hock (1992), adapted in (56):

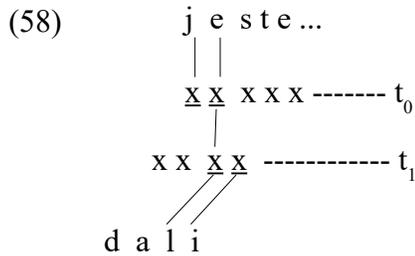
- (56) a.     *Je li oni pišu?*  
           JE LI they write  
           ‘Are they writing?’
- b.     *Je li će mi doći radost?*  
           JE LI will me come happiness  
           ‘Will happiness come to me?’

It is obvious that *je* is not an auxiliary in these sentences since the verbs are in the present tense. It is likely that this instance of *je* is a referring element, namely the third person feminine genitive clitic. In effect, this genitive pronoun may lack its own thematic node, as it depends on the noun it refers to get one. If so, it appears to be an anaphor, and as a result it is suitable to alternate with the relative anaphor *da* for certain speakers. Having no data on the use of this genitive pronoun, I will not discuss this suggestion further.

There are, however, cases where *je* does behave as an auxiliary, as illustrated in (57a) (cf. Milićević: 4b), whose input is shown in (57b). Since *je* co-occurs with a participle, it must be the case that it is the third person auxiliary. Thus, it is a matter to account for its unusual position at the beginning of the clause. I show that this position of *je* is consistent with, and indeed supports, the present analysis. In effect, since this auxiliary carries the stray morpheme to its right side, it can get it filter out without moving if it can be the mandatory host to another vector. This is exactly the case in *yes-no* questions, where the compound *da~li* must adjoin to a tensed verb in clause initial position if the complementizer is not used. Recall that adjunction always takes place at the skeletal level and links the leftmost x-slot of the adjunct to the rightmost one of the host. So being a vector, *li* correctly links itself to the first  $\omega$ -morpheme, ignoring the stray. This is shown in (58), where only the underlined x-slots are in the path of the linearization. It is self-evident that other auxiliaries which have the deficient morpheme on their back can never be used in such a context. If indeed such clitics were to be used

here, the cursor would start with the bare x-slot and would ignore the whole compound as stray.

- (57) a. Je li iko bio ovde?  
 AUX Q anyone been here  
 ‘Has anyone been here?’  
 b. *da~li'* [*je'~ste* iko bio ovde]



## 8. Some residual facts

This section is devoted to certain additional facts, including the delayed placement of clitics in a lower position in the structure, and the splitting of the cluster, which I will discuss in turn.

### 8.1 Delayed placement of auxiliary clitics

In the present analysis, auxiliary clitics appear in fact in the highest position of the structure, as they become a part of the first word, given the mechanics of the adjunction process. Since the derivation crucially depends on their placement, one may say that they take this as an opportunity to acquire the widest possible scope. However, if the first element in the structure is a phrase, it is obvious that the auxiliary should normally adjoin to the last word of it. Examples where the auxiliary acquires instead the first word of a phrase (a possessive determiner, the first part of a name, etc.) seem rather marginal, but at the same time they justify the absolute necessity for the auxiliary to be set up by adjunction. In other words, a careless speaker may in extremis force an auxiliary to the first word of a phrase to save what would be an ill-derivation, as in (17) above.

In the literature, it is acknowledged that the placement of the clitics takes place either after the first word (1W) or the first phrase (1P). However, if the latter is too long, a clitic avoids it. This fact prompts many to propose a mixed analysis partly based on syntax, phonology, and morphology. Mixed accounts of clitic placement are built on the observation that clitics are second, not in the sentence, but in their prosodic unit. This seems to be trivial since the prosodic unit is normally the basis of syntactic analysis. Indeed, in the syntactic structure, phenomena such as left or right dislocation, juxtaposed sentences, as

well as a variety of clauses are normally set aside, unless they are the subject of the study. For instance, an *if*-clause may precede a *wh*-question, but this possibility need not be taken into consideration in a study of *wh*-movement. To the best of my knowledge, one never asks why *wh*-elements do not move to the left edge of an *if*-clause or across a prosodic boundary.

Of course in certain contexts, it is not obvious to find out the limit of a prosodic unit, which is normally marked with a pause. In pro-drop languages, this is even more difficult since the subject can always be left-dislocated or interpreted as such without the appearance of a pause. Thus, in the following sentences, adapted from Čamdžić and Hudson (2007: 24-25), the clitic, which has been generated in the *t*-position (a notation used for expository convenience), can either adjoin to the participle verb (59a) or to the last element of the subject phrase (59b). The difference between these examples is likely due to a pause, which may be more or less perceptible after the subject phrase: in (59a), but not in (59b), a pause is simply assumed. If in (59b) the speaker accentuates the pause, the sentence may not be grammatical, as Čamdžić and Hudson point out.

- (59) a. Veliki sivi slon *t* spavao=*je* pored rijeke.  
 Big grey elephant slept is by river  
 ‘A big grey elephant slept by the river.’
- b. Veliki sivi slon=*je* spavao *t* pored rijeke.  
 Big grey elephant is slept by river.  
 ‘A big grey elephant slept by the river.’

Čamdžić and Hudson comment, “The longer the initial constituent, the more likely the delayed placement.” (p.12) Thus in the following example (adapted from their (26)), the clitic is normally affixed to the participle verb by rightward movement. Of course, such a long phrase will be almost always interpreted as left-dislocated, and therefore the auxiliary must be aptly generated so as to avoid this pitfall (also see below).

- (60) [Cirkuski sivi slon sa velikim ušima] *t* spavao=*je* pored rijeke.  
 Circus grey elephant with big ears slept is by river  
 ‘A big grey circus elephant with big ears slept by the river.’

To conclude, the prosodic effect is not a significant one in pro-drop languages, where the limit of left-juxtaposed structures is usually fuzzy.

## 8.2 Split clusters

In certain contexts it happens that auxiliary and pronominal clitics do not cluster together. The following example shows that the auxiliary clitic and the pronominal clitic are separated by a parenthetical clause (cf. Čamdžić and Hudson: 29; they use the slashes to indicate an intonation break.)

- (61)            Oni *su* // kao sto sam vam rekla // predstavili *se* Petru.  
                   they are as am you.dat said introduced self.acc Peter-dat  
                   ‘They, as I told you, introduced themselves to Peter.’

In this example, the auxiliary clitic normally adjoins to the highest element, and then the parenthetical clause is inserted in extremis, forcing the pronominal clitic to stay in situ in violation of OCP. This is not surprising since OCP is a structural constraint, which may not affect the interpretation of the structure. In fact, both versions of this constraint cannot be satisfied in this context: as the clitic is in situ, OCP1 is violated, but if it were to adjoin to the auxiliary, OCP2 would be violated. Such a sentence is anyway marginal, since even the auxiliary is too far from the verb, which shares its features, in violation of OCP2.

A more regular fact is the splitting of the cluster by negation. This appears to be a strong support for the assumption that auxiliary clitics are  $\omega$ -specified element, just like *wh* and negation. Consider the following paradigm (Rivero 1991, Schütze 1994):

- (62) a.        Ja *sam mu se* predstavio.  
                   I AUX him REFL introduced  
                   ‘I have introduced myself to him.’  
       b.        Ja *mu se* nisam predstavio.  
   NEG-AUX  
                   ‘I have not introduced myself to him.’  
       c.        \*Ja *sam mu se ni* predstavio/ne predstavio.  
       d.        Nisam *mu se* predstavio.  
       e.        \*Predstavio *mu se* nisam.

In (62a) all the clitics move from their post-verbal position within the VP to the auxiliary. However in (62b), to be compared with (62c), negation intercepts the movement of the auxiliary to the first element, but not that of the pronominal clitics, two important facts that must be accounted for. In

addition, (62d) (vs. 62e) shows that negation-auxiliary can be the first element of the structure, and hence a host for the pronominal clitics.

I claim that *nisam* is a morphological compound, i.e. the negative morpheme and the auxiliary are concatenated and 'sandhied' (cf. the vowel alternation) prior to the syntactic derivation.<sup>13</sup> As a result, their  $\omega$ -feature is switched off. The merging of negation and the auxiliary in the morphology may be another effect of the harmonization process; in effect, it aims to avoid the use of parochial rules. As seen above, the auxiliaries always target the first element in the structure to have the widest scope. If negation were not compounded with the auxiliary, the movement of the latter would trigger a transitory superiority effect, and the grammar would rely on the neutralizing effect of further vector adjunctions, as shown in the following ill-derivation:

- (63) a. [ja [ne<sup>1</sup> [[[predstavio sam<sup>2</sup>] mu] se<sup>3</sup>]]]  
 b. \*[ja=sam=mu=se [ne<sup>1</sup> predstavio ]]

But in sentences with no further vectors, the superiority effect would be permanent (64a), unless the auxiliary adjoins to negation (64b). If both (63b) and (64b) were possible, the learners would have the difficult task to process a constraint with two conditions: (i) if there are no further vectors to move, adjoin the auxiliary to negation; (ii) if there are other vectors to be adjoined in the structure, let the auxiliary adjoin to the first element. This is not consistent with the harmonization process, which bars such a type of constraints. Thus, the grammar opts for the compounding of negation and auxiliary in the morphology, allowing the placement of pronominal clitics to automatically follow from the OCP, which is not an absolute constraint.

- (64) a. \*Ja=sam<sup>2</sup> ne<sup>1</sup> vidio Marku  
 b. Ja ne=sam vidio Marku

Given the compound analysis of negation-auxiliary, one can derive (62b) from the input (65a) (the case features of each element are conveniently shown as a superscript instead of the tiered representation). The pronominal clitics exit two OCP domains, D1 and D2, as shown in (65b). In this structure, the subject is an evacuating domain for the OCP. However, if it is dropped, cf. (62d), the clitics can only exit their inner domain, D1, by adjoining to the compound, as shown in (66).

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13 The same result could be obtained by syntactic compounding (or adjunction), if one assumes a surface sandhi rule that alters the vowel of negation and thus destroys the boundary: *ne=sam* → *nisam*. More generally, this analysis can be adapted according to the general architecture of the grammar one assumes. I leave this point for future research.

- (65) a. [Ja [<sub>D2</sub> nisam<sup>A,O</sup> [<sub>D1</sub>[predstavio<sup>A,O</sup> mu<sup>O</sup>] se<sup>A</sup>]]]]  
 b. [Ja=*mu=se* [<sub>D2</sub> nisam<sup>A,O</sup> predstavio<sup>A,O</sup>]]
- (66) a. [<sub>D2</sub> nisam<sup>A,O</sup> [<sub>D1</sub>[predstavio<sup>A,O</sup> mu<sup>O</sup>] se<sup>A</sup>]]]  
 b. [<sub>D2</sub> nisam=*mu=se* predstavio]

Notice that a structure like (67) may not be possible as input or output under the assumption that negation, even compounded with the auxiliary, maintains its directionality as a head selecting the VP as its complement.

- (67) \*[[[predstavio<sup>A,O</sup> mu<sup>O</sup>] se<sup>A</sup>] nisam<sup>A,O</sup>]

As a further support for this analysis, one can show that negation and tensed verbs make up a compound as well. Consider the following sentences with simple negation (not compounded with auxiliary):

- (68) a. Ne vidim ga. / \*Ne ga vidim. / \*Ga ne vidim.  
 not see.1SG him.  
 'I do not see him.'
- b. Ana ga ne voli. /\*Ana ne ga voli.  
 Ana.NOM him.ACC not love.3SG  
 'Ana does not love him.'

As can be seen, in (68a) the clitic follows the verb, whereas in (68b) it precedes both negation and the verb. One may note in this respect that in standard French, (69), pronominal clitics adjoin to the negative morpheme *ne*, even in imperative sentences (69b). Given this French data, these SC facts are far from ordinary.

- (69) a. Marie ne *le* prend pas.  
 M. not it takes not.  
 'Marie does not take it.'
- b. Ne *le* prends pas!  
 'Don't take it!'

Under ordinary assumptions, the representation of (68a) includes two operators in two embedded domains, as can be seen in (70a). Thus, it is surprising that the pronominal clitic cannot exit the VP

domain and adjoin to negation, just as in French. Similarly, in the derivation (70b), the clitic cannot adjoin to negation; it has to pick up the subject, just like in positive sentences, (70c).

- (70) a.  $[ne^l [vidim^2 ga]] \rightarrow *ne^l=ga \text{ vidim}^2$   
 b.  $[Ana [ne^l [voli^2 ga]]] \rightarrow [Ana=ga [ne^l voli^2]] / *[Ana [ne^l=ga voli^2]]$   
 c.  $[Ana [voli^l ga]] \rightarrow Ana \text{ ga voli}^l$

The conclusion is inescapable: the sequence negation-lexical verb is a single syntactic unit, just like negation and auxiliaries. The generalization is that in SC negation and tensed verbs make up a compound. The native learners are hinted by the sandhi rule that affects the negation-auxiliary compound. And just like the latter, the  $\omega$ -features of this compound are neutralized, consistently with (31). This makes the prediction that no elements, adverbs or else, will ever appear between negation and tensed verb. So far, all the examples I have seen in the literature bear out this prediction. Thus, both of the problems just pointed out naturally disappear, as shown with the appropriate structures in (71). In (71a), the clitic stays in situ by lack of an escaping element, unlike (71b) where it normally exits the OCP domain headed by the compound verb-negation.

- (71) a.  $[nevidim \text{ ga}]$   
 b.  $[Ana [nevoli \text{ ga}]] \rightarrow Ana=ga \text{ nevoli}$

Strictly speaking, negation does not split the clitic cluster since it makes up a compound with every tensed verb. The pronominal clitic simply exit the domain headed by such a compound.

## 9. Conclusion

In this paper, I have presented an account of Serbo-Croatian clitics, including their placement and their ordering. The second position phenomenon, known as Wackernagel's Law, is mostly derived from the mechanics of both phonological and syntactic representations. Specifically, I have shown that the conjugation of auxiliary verbs exhibits a special characteristic in that it underlyingly consists in two morphemes, one of which has a floating melody in the sense of the x-slot theory of the skeleton. The full forms of the auxiliary are obtained by the application of a special morphological rule that links the melody to the skeleton prior to the syntactic derivation. On the other hand, if a conjugation form is meant to be a clitic, it enters the syntactic derivation as a deficient compound and it has to be set up in the earliest stage of the derivation by adjunction to a suitable element. The third person singular of *biti*, namely *je*, being different from the other persons in that it is the first morpheme in its compound, the

analysis correctly predicts that it must come in the cluster after all other clitics, except reflexive *se* which has the same characteristic. Indeed, if a pronominal clitic were to adjoin to *je* or *se*, it would target the bare x-slot of their floating melody, and would be filtered out as stray. Furthermore, this clitic is the pivot of the paradigm to the extent that it is a crucial hint to understand the logic of the system, just like the sandhi rule that affects the compound auxiliary-negation is a hint to the generalization that negation and tensed verbs are compounded. Without its special behavior, auxiliary clitics would not be used at all or else they would be reanalyzed as lexical entries on their own, and as a result this grammar would be significantly different. On this view, exceptions proceed from the same reason as the constraint that rules out string-vacuous operations, namely the learnability of the grammar.

This analysis is based on features that the interacting elements are specified for, a few universal constraints that need not be ranked, and the formalism used in non-linear phonology and morphology. The  $\omega$ -feature plays a crucial role in that it makes the clitics sensitive to superiority effect, just like *wh*-elements and negation. In addition, it lays on the assumption that head directionality is absent in Serbo-Croatian for the major components of the sentence, namely subject, verb and object. Thus, the grammar freely generates either an SVO, VOS, SOV, or OVS input. This great variety of input makes it possible to accommodate above all the placement of the auxiliaries, on which the success of the derivation depends. In fact, it may be the defectiveness of auxiliaries that lead the grammar to relax directionality. I believe that this analysis of the Wackernagel effect is basically correct. If it turns out that some assumptions on feature specification made here run afoul of additional data, it will be a matter to fix the details by updating the analysis, for the basic principles are universal and are not subject to parametric variations across languages. In fact, challenging new data may lead to the discovery of new features or universal principles.

This aspect of SC grammar helps shed light on an aspect of this feature- and constraint-based theory of grammar. In effect, it appears that the linearization process, seen in Desouvrey (2000) as a simple convention required by the oral modality–sign languages need not have it—has a more active role in the grammar, as it is used to filter out stray at the output.

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