Serbo-Croat-Bosnian clitics and Word Grammar[*]

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Abstract

Serbo-Croat-Bosnian has a complex system of clitics which raise interesting problems for any theory of the interface between syntax and morphology. After summarising the data we review previous analyses (mostly within the generative tradition), all of which are unsatisfactory in various ways. We then explain how Word Grammar handles clitics: as words whose form is an affix rather than the usual 'word-form'. Like other affixes, clitics need a word to accommodate them, but in the case of clitics this is a special kind of word called a 'hostword'. We present a detailed analysis of Serbo-Croat-Bosnian clitics within this theory which covers more of the data than any other analysis.

1 Overview of the problem

Serbo-Croat-Bosnian (henceforth SCB) has special clitics, in the sense of Zwicky (1977), which are second position or Wackernagel's clitics. For example (with clitics underlined as in all later examples):

(1) Juče sam joj ih dao.
yesterday am to-her it given
'Yesterday I gave it to her.'

The set of clitics comprises pronominal and auxiliary elements, as well as the reflexive clitic *se* together with the question particle *li*. (We discuss clitic prepositions at the end of this section.) When there is more than one of these clitics in a clause, they are positioned together in a cluster which cannot be broken up by any intervening material. The ordering within the cluster is fixed and as given below.

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li - aux - dat - acc - se - je (or je - se)

Notice the variability in the position of the reflexive *se* and the third person singular auxiliary *je*. Also, notice the split in the positioning of *je* and the other auxiliary forms. While *je* is found at the end of the cluster, other auxiliary forms are placed immediately after the question particle *li*.

In principle, the clitic cluster allows only one constituent of the clause (i.e. in WG terms, one dependent of the verb) to precede it. If we label this constituent 'X' and enclose it in square brackets, the placement facts are as follows.

(2) $[\text{Ivan}]_X$ je poljubio svoju baku.
$[\text{Ivan}]_X$ is kissed his grandmother.
'Ivan has kissed his grandmother.'

The X in (2) is a subject, the clitic is in the second position and the sentence is well formed. The absence of the X in (3), giving clause-initial placement of the clitic, leads to ungrammaticality.

(3) *Je poljubio svoju baku.
Is kissed his grandmother.
'Ivan has kissed his grandmother.'

The impossibility of clitic initial placement is related to the fact that SCB clitics are enclitics, requiring a host to their left. However, it is also impossible for the clitic to appear in the third position (or later) in the clause, as in (4).

(4) *$[\text{Ivan}]_{X1}$ $[\text{poljubio}]_{X2}$ je svoju baku.
$[\text{Ivan}]_{X1}$ $[\text{kissed}]_{X2}$ is his grandmother.

To be more precise, (4) fails if it is pronounced under neutral sentence intonation, but separating the subject from the rest of the sentence by an intonational break makes the sentence well-formed. Thus, (4) and (5) contrast minimally in that (5), with a pause after the subject, is well-formed.

(5) $[\text{Ivan}]_{X1}$ | $[\text{poljubio}]_{X2}$ je svoju baku.
$[\text{Ivan}]_{X1}$ $[\text{kissed}]_{X2}$ is his grandmother.

The initial X can be of any grammatical type, that is a subject, object, adjunct, verb, etc. In (6), the initial constituent is a direct object phrase.

(6) [Svoju baku]$_X$ je Ivan poljubio.
[His grandmother]$_X$ is Ivan kissed

However X need not be a complete clause constituent as such but may be merely the first word of such a constituent. For example, (7) differs from (6) in that the clitic is positioned immediately after the first word of the direct object phrase, that is, the phrase is split by the clitic.

(7) [Svoju]$_X$ je baku Ivan poljubio.
[His]$_X$ is grandmother Ivan kissed

Even more strikingly, X may be merely the lexical verb without any other part of the verb phrase, as in (8).

(8) [Poljubio]$_X$ je Ivan svoju baku.
[Kissed]$_X$ is Ivan his grandmother

This example is problematic for WG as the participle is separated from its dependents; but it is problematic for other theories as well, as it illustrates the much discussed phenomenon of so-called Long Head Movement. This is a problem because in movement analyses the verb is displaced from its original position to the sentence initial position, crossing over the auxiliary and thus violating the Head Movement Constraint of Travis (1984). Even more seriously, SCB does not allow the participle's dependents to be fronted with it. An example such as (9) , where the initial X is a full VP, is generally considered ungrammatical, although at least for some speakers, such examples are marginally possible.

(9) *[Poljubio svoju baku]$_X$ je Ivan.
[Kissed his grandmother]$_X$ is Ivan

The data in (1-9) describe the simplest cases of clitic positioning in main clauses. In **embedded clauses**, the clitic cluster preserves its second position, now immediately following the 'complementiser' (10).

(10) …da je Ivan poljubio svoju baku.
that is Ivan kissed his grandmother
'... that Ivan has kissed his grandmother.'

The intervention of any other element between the complementiser and the clitic leads to ungrammaticality (11).

(11) *…da Ivan je poljubio svoju baku.
that Ivan is kissed his grandmother

However, so-called **delayed placement** apparently allows the clitic to be placed in a position later than the second. One such example was given earlier as (5), where X follows another phrase separated from the rest of the clause by a pause. A further example is (12).

(12) [Veliki sivi slon]$_{X1}$ [spavao]$_{X2}$ je pored rijeke.
[Big grey elephant]$_{X1}$ [slept]$_{X2}$ is by river
'A big grey elephant slept by the river.'

Like (5), this example seems to require some kind of prosodic break between the two bracketed strings, though this may be less noticeable after a multi-word phrase (as here) than in single-word examples like (5). The delayed placement is actually optional since it is possible to attach the clitics to the end of a multi-word phrase like the one in the last example, giving (13).

(13) [Veliki sivi slon]$_{X}$ je spavao pored rijeke.
[Big grey elephant]$_{X}$ is slept by river.
'A big grey elephant slept by the river.'

However, it is a fact of SCB that the longer the initial constituent, the more likely the delayed placement. Thus, the very long initial phrase in (14) is very unlikely to be a clitic host and the tendency for the delayed placement of clitics is very high.

(14) [Cirkuski sivi slon sa velikim ušima]$_{X1}$ [spavao]$_{X2}$ je pored rijeke.
[Circus grey elephant with big ears]$_{X1}$ [slept]$_{X2}$ is by river.
'A grey circus elephant with big ears slept by the river.'

Such examples show that the 'second-position' generalisation is only true in the sense that first-position is not possible and that second position is always possible after a single-word constituent. Indeed according to Bennett (2002), delayed placement is common in SCB. A further example of delayed clitic placement is given in (15), where the clitic is pushed to a later position by the intervening appositive and parenthetical phrases i.e. the classes of constituents characterised with parenthetical intonation.

(15) Ja, tvoja mama, kupiću ti sladoled.
I-nom, your mother, buy-will to you ice-cream.
'I, your mother, will buy you an ice-cream.' Radanović-Kocić (1996)

As example (16) illustrates, the same pattern is possible in embedded clauses.

(16) Mislim da, kao što smo već rekli, Ivan će svirati
Think-I that, as we-are already said, Ivan will play
na sutrašnjem koncertu.
in tomorrow's concert.
'I think, that as we have alrady said, Ivan will play in tomorrow's concert.'

In general, then, it seems that the clitic and its host may in fact follow a considerable amount of material from the same clause, provided that this is sufficiently distinct in terms of prosody and/or complexity. We can call this material 'preliminary material'.

Furthermore, certain **conjunctions** or prepositions never host the clitic cluster, causing obligatory delayed placement, while others allow the two possibilities i.e. either the regular second position pattern or the delayed clitic placement. An example of the first kind is the conjunction *i* ('and'), while the second kind includes *jer* ('because'). Examples (17) and (18) illustrate the placement of clitics after *i*, while (19) and (20) show the clitic positioning after *jer*.

(17) Marija je ubrala cvijeće **i** Ivana ga stavila u vazu.
Maria is picked-up flower, **and** Ivana it put-part in vase.
'Maria has picked up a flower and Ivana has put it in the vase.'

(18) *Marija je ubrala cvijeće **i** ga Ivana stavila u vazu.
Maria is picked-up flower, **and** it Ivana put-part in vase.
'Maria has picked up a flower and Ivana has put it in the vase.'

(19) Raduj se, **jer** došao ti je brat.

Be-happy se , **because** come-part to-you is brother.
'Be happy because your brother has arrived.' Radanović-Kocić (1996)

(20) Došao je **jer** je saznao da si tu.
Come-part is **because** is found-out that you-are there.
'He came because he has found out that you are here.'
Radanović-Kocić (1996)

Further data of relevance to this paper concern clitic climbing and the somewhat marginal pattern of the so-called 'split clusters'. **Clitic climbing** is possible out of the complements of certain verbs (mostly the verbs of volition). It is obligatory when the complement is an infinitival form and marginally possible when the complement is a *da* clause.

(21) Ivan ga je htjeo vidjeti.
Ivan him is wanted see _
'Ivan wanted to see him.'

(22) Ivan ga je htjeo da vidi.
Ivan him is wanted that sees.
'Ivan wanted to see him.'

These two complement patterns are distributed regionally, with infinitives in the west (mainly Croatia) and *da* clauses in the east (mainly Serbia).

Finally, we must recognise a marginally possible pattern, discussed by Bošković (2000), where the clitic cluster is **split** as in (23).

(23) Ivan je vidjeo ga juče.
Ivan is seen him yesterday.
'Ivan saw him yesterday.'

The grammaticality of (23) is questionable. Some speakers accept it, while other do not.

This survey has ranged widely over the patterns of cliticization found in SCB, and the WG analysis that we shall present below will cover most of the facts mentioned here. We shall draw attention to the gaps which are inevitable given the space available here.

2 Previous analyses

SCB clitics have been a subject of vigorous research over the years, and consequently,

the literature on the subject is extensive (Bennett 1987, 2002, Boeckx & Stjepanović 2000, Bošković 1995, 2000, 2001, Caink 1998, Franks 1997, Halpern, 1995, Progovac 1996, 2000, Radanović-Kocić 1996, Rivero 1993, 1997, Roberts 1992, Schütze (1994), Stjepanović 1998, Tomić 1996, Wilder and Čavar 1994a, 1994b, Zec and Inkelas 1990, etc) . There are a great many analyses because SC[B] is increasingly becoming a testing ground for theories of second position cliticization. As a result, the argumentation and the kind of data examined with respect to second position cliticization in SC have reached a level of subtlety not attested in the discussion of the phenomenon in other languages." (Bošković 2001:8)

The most extensively discussed issue of SCB cliticisation in the GB/Minimalist literature is what role phonology plays in explaining the 'second position' (P2) of clitics. On this basis we can divide the analyses roughly into three groups:

- those which maintain that P2 is entirely a syntactic phenomenon, as is, for instance, maintained by Franks (1997), Progovac (1996, 2000), Rivero (1997), Roberts (1994), Tomić (2000), Wilder and Čavar (1994a and 1994b), etc
- those that claim that P2 is entirely a phonological phenomenon as in Caink (1998), Radanović-Kocić (1996),
- those which argue that both syntax and phonology play a role in deriving P2 effect (Halpern (1995), Schütze (19994), Bošković (2000, 2001), etc.

It is beyond the scope of this paper to present and discuss all the work done on SC clitics so far. Rather, we shall restrict ourselves to three particular accounts, namely those proposed by Progovac (1996), Schütze (1994) and Bošković (2001) and provide a very brief overview of these.

Progovac's analysis of P2 cliticisation parallels the classical analysis of V2 phenomena. The basic claim is that in all constructions clitics are found in a unique structural position, identified as the head of CP to which the clitics right-adjoin (Figure 1.) The preceding material is either brought forward to Spec C by a variety of syntactic movements (topicalisation, wh-movement, etc) or it is the complementiser (e.g. *da*) in embedded clauses.

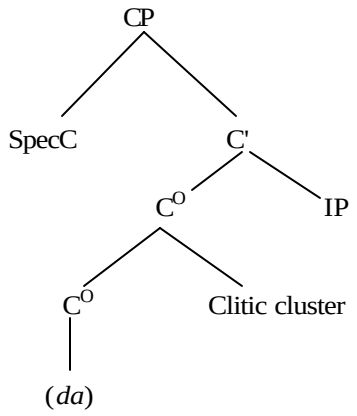

Figure 1

For example, consider how this analysis would apply to (1), repeated here:

(24) Juče sam joj ih dao. (= (1))
yesterday am to-her it given
'Yesterday I gave it to her.'

Juče would be topicalised into Spec C, C itself would be empty, and the clitic cluster would be adjoined to C, leaving *dao* in IP.

This analysis treats P2 in main clauses just like V2, in which the finite verb is placed after a single extracted element. The analysis unifies two apparently distinct phenomena, which is a benefit if they really are the same, but it has serious weaknesses:

- It does not explain the special relation between the extracted material and an overt complementizer, whereby exactly one of them is obligatory; this must be handled by a filter such as the 'Doubly-filled Comp Filter', which is an arbitrary stipulation that detracts from the structural explanation (albeit a stipulation which is needed for other constructions).
- It does not explain why a participle can be fronted on its own as in (8). As mentioned earlier, it is impossible to front the entire VP, which is strange if fronting is due to extraction; and examples like (8) also involve Long Head Movement, contrary to the Head Movement Constraint.

(25) $[Poljubio]_X$ je Ivan svoju baku. (=(8))
[kissed] is Ivan his grandmother

- It does not explain why the pronominal clitics move to C, or why they cluster.
- It does not explain delayed placement, as in (12-16); even if the 'preliminary material' is adjoined to CP, the strong pressure for prosodic distinctness remains to be explained.

The mixed syntactic and phonological account increases the number of possible derivations by admitting the possibility of manipulating linear order by mechanisms which do not fall within the domain of syntax proper.

Schütze (1994) argues for the following proposal. All constructions which are arguably built by well-formed syntactic rules are derived in syntax. In this respect, Schütze's proposal is exactly like Progovac's i.e. the clitics cluster under C^0 and are preceded by the fronted material. However, when a sentence is acceptable but there is a reason to believe that strictly syntactic rules have been violated, such constructions must have been derived in a different module of the grammar, namely phonology. Phonology allows for changes in the linear order of syntactic elements by at least one operation – so-called Prosodic Inversion (PI). The PI analysis was first developed by Halpern (1995) and later modified by Schütze (1994). We choose to discuss the version of the proposal as developed by the latter since it is closer to Progovac and thus makes the comparison easier.

The rule of PI operates at the post-syntactic level (i.e. at the phonological level of representation) and is triggered by the phonological properties of clitics – namely, the need for a phonological host. It moves the clitic cluster to the right, across the first prosodically well formed lexical item. PI is only triggered when the output of the syntactic derivation is such that no phonological host is provided and as such it is really a sort of a repair mechanism.

The most convincing case of a construction which would have to be derived by PI is the fronting of the verb in so-called Long Head Movement constructions as illustrated in (25 = 8) above. The problem here for other analyses is that the fronting of the verb looks like an instance of head movement. Since the lexical verb – the head – crosses over another head i.e. a clitic auxiliary, such sentences exhibit a violation of the Head Movement Constraint - a violation of the syntactic conditions on the displacement of heads - and, hence, must have been derived in phonology which allows this type of movement. The steps in this analysis are as shown below:

(26) Step 1. je poljubio svoju baku.
is kissed his grandmother.
Step 2. poljubio je svoju baku.
kissed is his grandmother.

The derivation thus saves clitic-initial sentences by repairing them in phonology with the mechanism of PI. This solves the problem of Long Head Movement by removing it from syntax, and also explains a further interesting set of data in which a clitic apparently occurs inside a fronted PP:

(27) U ovu je veliku sobu ušao.
In this is big room entered.
'He entered into this big room.'

In this example the first word after the supposedly initial clitic *je* is itself a clitic, so it is not a suitable host for the other clitic, which therefore moves after the next word in spite of the grammatical phrase boundaries.

However for all its apparent success in these two cases, Schütze's analysis has a number of serious weaknesses:

- The analysis increases the possibilities of clitic placement that the grammar permits. In particular, the grammar predicts that *any* phonologically strong element is capable of hosting the clitic cluster. As noted by Bošković (2001), even in clause-initial position this is not always true. For example, SCB has a set of prepositions which may be either phonological clitics or phonologically strong, but even the phonologically strong preposition cannot act as host to a clitic:

(28) *Preda su ga kuće ostavili.
In-front-of are him house left.
'They left it in front of the house.'

- A fortiori, the analysis does not explain why multiple clitics cluster together.
- The explanation for examples like (27) is redundant if (as claimed by Bošković 2001:20) a preposition phrase can be split in the same way by non-clitics. Here are Bošković's examples, in which the intervener is the personal pronoun *on (he)* and *Jovan* which do not belong to the set of second position clitics.

(29) (?) U ovu on veliku sobu ulazi.
In this he big room enters
'He enters into this big room.'
(30) (?) U ovu Jovan veliku sobu ulazi.
In this Jovan big room enters

'Jovan enters into this big room.'

In short, there is no need for the phonological sledge-hammer of Prosodic Inversion in order to crack what is basically a syntactic nut.

Finally, we discuss the proposal by **Bošković** (2001). Bošković argues for a syntactic analysis of all the elements which precede the clitic cluster. In this respect, his claim is similar to Progovac (1996). However, unlike her, Bošković argues against a structurally fixed syntactic placement of clitics, arguing that they can be found anywhere in the tree, as long as the second position requirement is satisfied. The second position requirement is imposed in phonology by the lexical specification of clitics which is as given below:

(31) 1. suffix
2. #_

In words, SCB clitics require a preceding phonological host; this is the first clause of the definition above. The second clause states that clitics have to be immediately after the intonational phrase boundary (indicated by '#'). This second clause in isolation would derive clause initial clitics. However, given that the requirement of 1 also has to be satisfied, the result is P2 placement.

It is clear from the above that for Bošković, the domain of cliticization is an intonational phrase rather than the syntactic clause. The argument for this position is the delayed placement of the clitic cluster in the presence of parentheticals. Consider the following:

(32) * Ja # tvoja mama# sam ti obećala sladoled.
I your mother am to-you promised ice-cream.
'I, your mother, promised you an ice cream.'
(33) Ja # tvoja mama# obećala sam ti sladoled.
I your mother promised aux to-you ice-cream
'I, your mother, promised you an ice cream.'

The presence of the pauses which offset the appositive in the example above is what causes the clitic to be spelled out in a lower position then the second position of the clause. Assuming that the position of the subject is not different in this example from its position in the equivalent sentence without the appositive, it follows that the second position is correctly defined as the second position of the Intonational Phrase, rather than the second position of the clause.

Once again, there are serious weaknesses in this analysis:

- If the only restriction on clitic position is phonological, the presence of a parenthetical in the middle of a clause should also provide a possible site for clitics. For example, alongside (33) we should find (34), but this is in fact ungrammatical.

(34) Sladoled ja # tvoja mama# obećala sam ti.
ice-cream I your mother promised aux to-you
'I, your mother, promised you an ice cream.'

- Nothing explains why clitics cluster together.
- The analysis seems to exclude clitics attached to *da* as in (10) and (20). It seems unlikely that *da* always follows a prosodic boundary in such examples.

(35) …da je Ivan poljubio svoju baku. (=(10))
that is Ivan kissed his grandmother
'... that Ivan has forgotten his grandmother'

(36) Došao je **jer** je saznao da si tu. (=(20))
Come-part is **because** is found-out that you-are there.
'He came because he has found out that you are here.'

In conclusion, the previous analyses have already established a number of important descriptive facts about SCB clitics (which we listed in section 1), and have highlighted the dual role of clitics as syntactic elements with the special 'phonological' property of needing an immediately adjacent host to 'lean' on. Bošković's analysis has the added virtue of relating clitics explicitly to suffixes. However the analyses suggested also have serious weaknesses, so there is clearly room for alternative approaches. One kind of alternative that has already been offered for slavic clitics has rested on the ideas of Optimality Theory (e.g. Anderson 1996, Legendre 1999). However the analysis that we propose below is radically different from all the previous analyses and (we believe) avoids these weaknesses - though we shall admit the gaps that we are aware of.

3 Towards a Word Grammar analysis of SBC clitics

At the heart of the WG analysis is the rather obvious idea that clitics are part affix and part word. As affixes, their position is determined by the rules of morphology, and they

behave phonologically like word-parts. As words, they have regular syntactic dependency relations to other words and typically carry separate referents. For example:

(37) Juče sam joj ih dao. (=(1))
yesterday am to-her it given
'Yesterday I gave it to her.'

In terms of morphology, this sentence contains just two words:

- *Juče-sam-joj-ih*: this word has a typical rigidly fixed morphological structure (stem followed by three suffixes - compare Latin *am-ab-a-t-ur* 'he/she used to be liked', consisting of the stem *am* plus four rigidly ordered suffixes); it also carries a single word-stress.
- *dao*: an ordinary word.

But in terms of syntax, there are five words (as shown in the conventional orthography) with ordinary dependencies as shown in Figure 2.

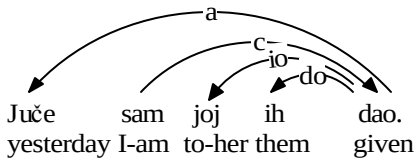

Figure 2

The syntax is not responsible for where the clitics stand - which is fortunate, because word order is otherwise very free in SCB so rigid ordering for these words would be quite hard to formalise. But neither is the morphology responsible for selecting the stem and clitics and for deciding which combinations are possible. This is handled by the syntax.

Clitics are clearly a challenge for any theory of sentence structure, but especially so for one like WG in which the difference between intra-word and inter-word patterns - morphology and syntax - is so fundamental. This has been recognised since the earliest work (Hudson 1984:48-50). However a word-based theory is precisely what is needed for clitics because phrases are no help. All we need is more flexibility in applying word-based analysis - the flexibility to recognise **whole words as parts of larger words**. This idea is easy to develop in WG, and does not in fact conflict with any fundamental principles of the theory; Hudson (2001) is a general discussion of clitics with detailed application to French and tentative speculation about SCB.

For example, suppose we say that *juče-sam-joj-ih* is indeed a word, within which there are four smaller words. This analysis is shown in Figure 3, where the straight lines show part-whole relations. (We shall revise this analysis later by distinguishing each of these words from its morphological realisation - see Figures 8 and 9.)

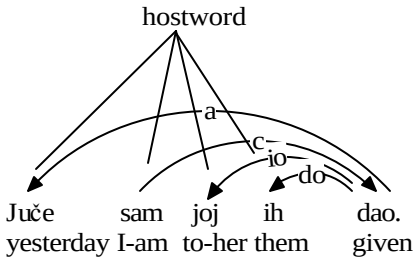

Figure 3

The following are the consequences of taking *juče-sam-joj-ih* as a single word. First, it is not an example of any other word - of *juče* or *sam*, for example. Instead it is a special word which is not a lexeme but which exists solely for the purpose of accommodating clitics. The presence of this larger word can be required (in the grammar) by the clitics, so it is only needed where clitics are present. Unlike other words it has no inherent phonology or semantics, but it does have a morphological structure, so we can recognise a generalised word-type called '**Hostword**' of which this is an instance. (Notice the terminological distinction between *hostword* and **host**: a hostword is a special kind of word which consists of one or more clitics plus their host, which is an ordinary word; in this example the hostword is *juče-sam-joj-ih*, while the host is *juče*.)

Second, this word's morphological structure is defined by rules just like the other rules of morphology - and it is interesting to notice that SCB has quite rich inflectional morphology, so the rules for clitic clusters are not out of place in this language[1] . This morphological structure explains the relative order of clitics, why they have to follow a host and also why they cluster together. (We shall explain this consequence below.)

Third, it has the phonological properties expected of a single word - a single word stress, and of course no internal prosodic boundaries. This is why clitics cannot be separated from their host by an intonation boundary.

And finally, what is especially interesting about P2 clitics (such as the SCB ones) is that

[1] Maybe there is a general typological tendency for special clitics to co-occur with rich inflectional morphology; we don't know whether this is generally true, but it does seem to be true of the languages we know about.

the hostword also seems to have some ordinary **syntactic** properties. First, the easiest way to say that clitics occur in second position is to say that all the other words in the clause depend on the hostword. In our example, this means that *dao* ('given') depends not only on the auxiliary *sam*, but also on the hostword. Once this dependency is in place, it is easy to require all the dependents of a hostword to follow it, so the hostword must be the first word in its clause - hence the 'almost initial' position of the clitics. The second position is merely a matter of morphology - they are like suffixes (as in Bošković's analysis), so the first word is the host (*juče*, 'yesterday').

Moreover we can even use the hostword to deal with delayed placement, where 'preliminary material' stands before the hostword:

(38) [Veliki sivi slon] [spavao]x je pored rijeke. (=(12))
big grey elephant slept is by river
'A big grey elephant slept by the river.'

In this example the hostword is *spavao-je*, but it is not clause-initial. What is needed, it seems, is a pre-dependency by virtue of which *slon* ('elephant') may precede it. This is easily arranged by permitting a hostword to have one or two pre-dependents. It is less clear how to take account of the prosodic restrictions noted earlier, but the same is true in WG of all prosody so we cannot expect to be able to make progress on this point until we have a better theory of prosody.

Given these syntactic roles that the hostword seems to play, it is not surprising that P2 clitics (so-called Wackernagel clitics) are related historically to V2 patterns, so that languages frequently move from one type to the other. This diachronic pattern has been documented in the Slavic languages by Bennett (1987, 2002), and more generally by Anderson (1993). In both kinds of language a finite auxiliary may be in second position, either by virtue of being finite (V2) or by virtue of being a clitic (P2), so languages can easily slip between the two types by gradually shifting the balance of features between finiteness and clitic-hood. On the other hand, we are not saying that P2 and V2 structures are very similar. They are not:

- V2 structures involve extraction: the finite verb has a single pre-dependent (which is extracted). They do not involve a hostword.
- P2 structures involve a hostword, and do not involve extraction except to the extent that delayed placement requires it. In a 'pure P2' language there would be no extraction.

The hostword, then, is the main idea behind the WG analysis of SCB clitics. So far as we know it is original, but of course the general idea that special clitics are subject to morphological constraints as well as syntactic ones is not at all new. In the rest of this paper we shall develop the idea in more detail and with a little more attention to formalisation.

4 A WG analysis of SCB clitics: dependency structures

We shall take for granted all the ordinary syntactic dependencies such as those shown in Figure 2. The challenge is to integrate them with the extra relations (morphological and syntactic) needed for the hostword, but we start with a general look at ordinary (non-clitic) word order in SCB. We shall see that there is a great deal of syntactic 'raising' which makes word order extremely free - a freedom which contrasts even more markedly with the rigid ordering of clitics.

In general, word order within the clause is **free**, so a verb and its dependents may occur in any order.

(39) a. Ivan voli slatki čaj.
'Ivan likes sweet tea.'
b. Voli Ivan slatki čaj.
c. Slatki čaj voli Ivan.

Free order is handled in WG simply by having no word-order rules - i.e. no default or overriding word-order rules, in contrast with languages like English.

However SCB clause order is even free-er than this, because it allows apparent phrases to be split; for example, the phrase *slatki aj*, 'sweet tea', can be split by the verb or other dependents of the verb:

(40) a. Slatki Ivan voli čaj.
b. Ivan slatki voli čaj.
c. Čaj Ivan voli slatki.
d. ??Čaj Ivan slatki voli.

The easiest way to explain this pattern is to allow *slatki* to depend directly on the verb as well as on č*aj*. This is just like the 'raising' that we recognise in subject-sharing,

extraction or extraposition, whereby a dependent of one word also depends on this word's parent. If *slatki* depends on *voli*, 'likes', then it can move freely around this word regardless of where its other parent is. The result of raising is a structure like Figure 4, in which 'x' is the label for the raising dependency and may be thought of as short for 'extra', and as reminiscent of both 'x<' ('extractee') and '>x' ('extraposee').

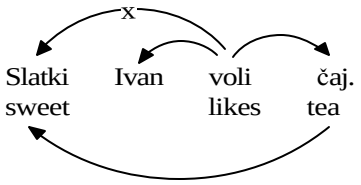

Figure 4

This raising is possible for a noun's pre-modifiers, but not for post-modifiers, so a prepositional phrase (for example) cannot be separated from the head noun. (This is presumably related, at least functionally, to the fact that pre-modifiers carry case but post-modifiers, such as prepositional phrases, do not.)

(41) a. Ivan vidi čovjeka [u crnom šeširu].
Ivan sees man [in black hat]
'Ivan sees a man in a black hat.'
b. *[U crnom šeširu] Ivan vidi čovjeka.
c. *Čovjeka Ivan vidi [u crnom šeširu].

Nor can a preposition be separated from its complement:

(42) a. Ide prema kući.
he-goes towards house
'He goes towards the house.'
b. *Prema ide kući.

In short, it is not the case that the No-Tangling Principle (or its equivalent) is totally suspended in SCB. Word order is free, but not totally free.

Raising is also possible where we might expect 'clause union' to be possible - i.e. in the

complements of auxiliaries and auxiliary-like verbs such as 'want'. In such cases, the complements own dependents are free to move around within the main clause as though they depended on the main verb directly - as indeed they do, according to the proposed analysis. For example:

(43) a. Želim pojesti jabuke.
I-want eat apples
'I want to eat apples.'
b. Jabuke želim pojesti.
c. Jabuke pojesti želim.

Raising is even possible out of some finite complements:

(44) Koga ne želiš da voliš?
who not you-want that you-love
'Who don't you want to love?'

The different kinds of raising can combine freely to give examples in which a noun's pre-dependent is raised to depend on the noun's parent, whence it is further raised to depend on the latter's parent as in (45), diagrammed in Figure 5.

(45) Slatke želim pojesti jabuke.
sweet I-want eat apples

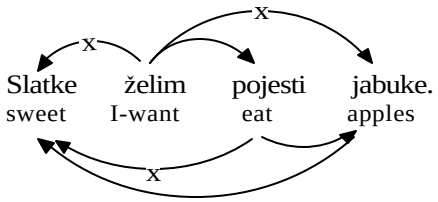

Figure 5

The raising analysis will be helpful when we turn to clitics because it will allow us to explain which words may stand before the clitics: any word which is raised to depend on the clause's top verb. For example, a clitic may follow a separated pre-modifier of a noun, but not a noun separated from its post-dependent.

(46) [Svoju baku]$_X$ je Ivan poljubio. (=(6))
[his grandmother]$_X$ is Ivan kissed.

'Ivan has kissed his grandmother.'

(47) [Svoju]$_X$ je baku Ivan poljubio. (=(7))
[his]$_X$ is grandmother Ivan kissed.

(48) a. Tog je Ivan video čovjeka.
That is Ivan seen man
'Ivan saw that man.'
b. Čovjeka je Ivan video [u crnom šeširu].
Man is Ivan seen in black hat

(We assume that in SCB demonstratives such as 'that' depend on the noun, in contrast with English where they are determiners; so far as we know there is no evidence for the reverse dependency in SCB.) Examples like these show that a noun's pre-modifiers may be raised but its post-modifiers may not. On the other hand, this raising is clearly optional because the whole noun phrase may precede the clitic:

(49) Tog ovjeka je Ivan video.
That man is Ivan seen
'Ivan saw that man.'

In contrast, 'clause-union' raising appears to be obligatory. If so, we have an explanation for the curious facts which were so troublesome for the Minimalist analyses because of Long Head Movement. If all the dependents of a participle must obligatorily raise to depend on the auxiliary, it is to be expected that the participle alone can act as the clitic host, but that its dependents must take their position from the higher verb:

(50) a. [Poljubio]$_X$ je Ivan svoju baku. (=(8))
[Kissed]$_X$ is Ivan his grandmother
'Ivan forgot his grandmother.'

(51) b. *[Poljubio svoju baku]$_X$ je Ivan. (=(9))
[Kissed his grandmother]$_X$ is Ivan

The dependency structure for the grammatical example is shown in Figure 6 (without the hostword structure). The main feature of this diagram is that *baku* depends on both its 'true' head *zaboravio* and its 'extra' head, *je*. One of these dependencies must be in the surface structure, determining word order, but there is no choice in the matter thanks to the 'raising principle' which always selects the higher of the two parents - the one on

which the other parent depends (Hudson 2000).

Figure 6

The main point of this section has been to show that SCB has rather generous 'raising' rules which allow semantic phrases to be split between two positions within a clause; the key examples were phrases such as *slatke jabuke*, 'sweet apples' and *poljubio svoju baku*, 'kissed his grandmother' whose words may be scattered more or less freely through the clause thanks to the enriched dependency structure. This freedom of word order is the background to the discussion of clitics in the next section.

5 A WG analysis of SCB clitics: clitics as affixes

The other half of our analysis focuses on the clitics and their relation to the hostword. Since this is a matter of morphology we shall be using the general theory of inflectional morphology described in Creider and Hudson (1999). We start therefore with a brief discussion of ordinary non-clitic inflectional morphology.

Word-types are of two kinds: lexemes and inflections. (We shall add two further kinds for clitics below.) An inflected word inherits both from some lexeme and from at least one inflection; for example, *dogs* inherits from both DOG and Plural, and *isn't* inherits from BE and from Singular and Negative. These classifications handle the syntactic and semantic effects of morphology, so the morphological structure itself is invisible to syntax and semantics. The word (e.g. *dogs*) has a morphological structure (*dog* + *s*), but this is not directly relevant to syntactic or semantic rules, which treat a regular plural in exactly the same way as an irregular one such as *mice*.

However the word classes are directly relevant to the morphological structure, because they determine it (by inheritance). In regular examples the inflected word inherits its stem from its lexeme and its affixes from its inflection - so *dog* comes from DOG and *s* from Plural. Figure 7 shows these simple relations.

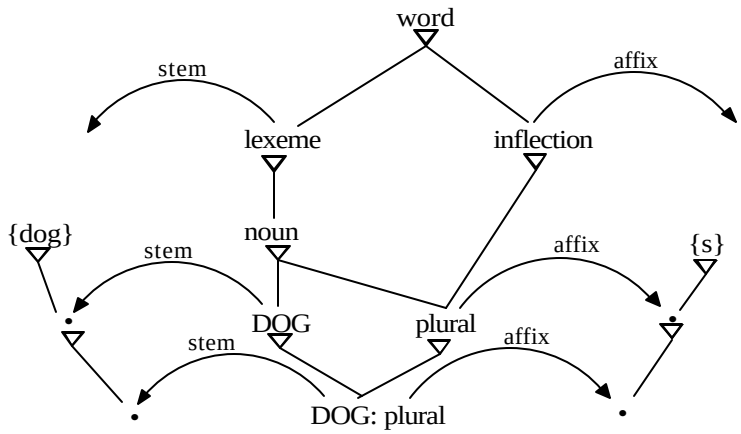

Figure 7

Perhaps the most important feature of this analysis is the clear distinction that it draws between a word and its structure. The word is an abstract object that has syntactic, semantic and contextual characteristics in addition to its observable manifestation in pronunciation or print. The observable part is not the word, but the word's structure. Even when the structure is simple, it is distinct from the word - a morpheme such as {dog}, not a word such as DOG. This clear distinction allows for homonymy - two distinct words which share the same structure.

It also opens the way to a theory of clitics in which the hostword is distinct from the clitics and their host; in just the same way that DOG: plural is a distinct entity from the morphemes {dog} and {s}, the hostword *Juče-sam-joj-ih* is distinct from the forms {juče}, {sam}, {joj} and {ih}. The only difference between the two cases is that the morphemes in the second have a dual function. For example, the morpheme {juče} is the stem of two words at the same time - of the word *juče* and also of the hostword; and {ih} doubles up as the stem of *ih* and also as a suffix of the hostword. Figure 8 shows the relevant structure both for this example and for the simpler case of *dogs*.

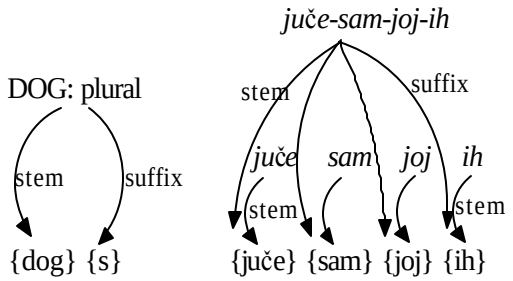

Figure 8

How does the grammar determine the order of morphemes within a word? Labels such as 'suffix' are mere labels, and need to be supplemented by explicit rules about order; and this becomes even more important when multiple suffixes co-occur in a fixed order. The same fixed order is typical of brief automatic 'scripts' - internally ordered actions such as taking a step, opening a door or changing gear - so we invoke a very general theory of wholes and parts which is not specific to language, let alone to morphology. An event has a 'whole' which has parts that are ordered relative to each other:

- when doing such-and-such, first do this, then this, then this ...
- When taking a step, first raise a foot, then move it forward, then ...
- When saying a word, first say its stem, then say its first affix, then ...

To show the ordering of the parts we can simply assign them ascending numbers, but typically the order is independent of which parts are actually present, so the numbering reflects the maximum complexity. For example, if four suffixes are possible, the last will always be labelled '4', regardless of which other suffixes are present.

When we apply this system to *dogs*, we find that:

- its whole is {dogs};
- the first part of its whole is {dog}, which is also its stem;
- the second part of its whole is {s}, which is also its suffix.

This may seem a cumbersome way to express the trivial fact that suffixes follow stems, but it pays off in more complex cases such as SCB clitic clusters. Recall the formula for clitic ordering in the opening paragraphs of this paper: *li - aux - dat - acc - se - je (or je - se)*. This can be captured by a global formula for hostwords which recognises one slot for the stem (i.e. the word acting as host) and six numbered slots, with the last two sharing the same number:

Host *li - aux - dat - acc - se - je*
0 1 2 3 4 5 5

When we apply this formula to our example *juče-sam-joj-ih*, we find that it has the following parts:

{juče} {sam} {joj} {ih}
0 2 3 4

Figure 9 shows the morphological structures both for *dogs* and for this hostword, including the word-morpheme relations shown in Figure 8.

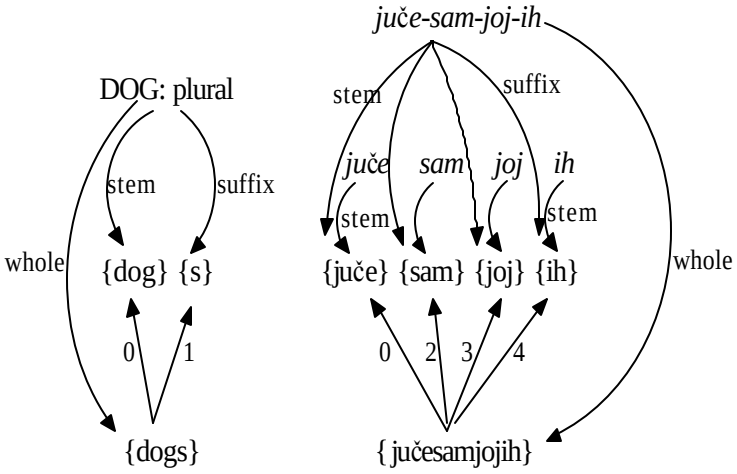

Figure 9

The analysis offered so far has already solved two problems:

- how to reveal the similarities between clitics and affixes: the stem of a clitic is also an affix of the hostword;
- how to determine the order of either clitics or affixes relative to each other and to their 'host' or stem: each item is assigned a specific 'part' function relative to the larger unit.

The remaining problems all relate to the hostword:

- to explain why there is a hostword;
- to ensure that all the clitics share the same hostword - i.e. how to explain why they cluster together;
- to explain how the hostword selects its stem, the clitics' host;
- to explain clitic climbing.

We can take the problems one at a time in the next section.

6 A WG analysis of SCB clitics: hostwords

Why is there a hostword? The answer is obvious: because there are clitics. Wherever clitics occur, there must be a hostword; and without clitics, there should be no hostword. To formalise this link we recognise two additional general word types, alongside the two recognised earlier (Lexeme and Inflection). They are Clitic and Hostword.

As we have already recognised, clitics are distinguished by the fact that they behave like affixes in some respects and like other words in other respects, and since this is a general property shared by a number of words, we need to recognise a general category. Of course this category is not mutually exclusive with the other categories; for example clitic pronouns are pronouns (a kind of lexeme class) as well as clitics, and clitic auxiliaries are auxiliary verbs as well as clitics. This is not a problem because multiple inheritance is quite normal - every inflected word inherits simultaneously from a lexeme and an inflection, so lexical clitics can inherit from a lexeme and the general category Clitic. What they inherit from Clitic is the characteristic of having a structure which doubles up as the affix of a larger word. This structure may happen to be a mere stem, but some clitics are inflected (e.g. arguably *sam* consists of a root *s* and a suffix *am*) so it would be better to refer to the clitic's whole - its entire structure. Thus, a clitic's whole doubles as the affix of a larger word - a hostword.

Hostwords are the reverse side of the Clitic coin, because a clitic needs a hostword. Any affix needs a 'host' in the sense of a word to hold it, but most affixes are linked to specific inflections - e.g. {s} is linked to Plural or (verbal) Singular. This is not how clitics work; they do not realise inflectional categories but contribute to meaning via their syntax just like free-standing words. So clitics need a special kind of containing word which will simply give them a place in the sentence without requiring any work in return (so to speak). This is a hostword, whose main role (in terms of communication) is to hold clitics and keep them in order. It has no meaning, but, as we saw in earlier discussion, it may have syntactic dependencies of its own. Most obviously, SCB hostwords have all the other clause elements as their dependents, and a constraint that they must all follow it - hence the 'second position' of the clitics. If we also allow hostwords to have one or two pre-dependents we can explain examples such as (38), where preliminary material stands before the hostword. In short, hostwords are words, but words with very special morphology, rather limited syntax and no semantics.

In other words, a clitic's whole is always the affix of a hostword; as soon as we classify, say, *sam* as a clitic, it inherits the need for a hostword, and this hostword inherits whatever morphological and syntactic characteristics typical hostwords have (including, in SCB, the fact that *sam* fills the second affix slot). This special relation between clitics

and hostwords can be seen in Figure 10.

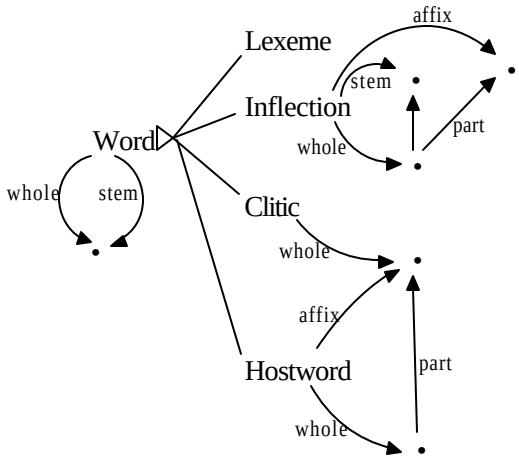

Figure 10

This, then, is why there is a hostword: because any clitic inherits (from Clitic) the need for a hostword such that the clitic's whole can act as an affix in the hostword. The next question is why clitics cluster - why all the clitics within a given clause must share the same hostword. The answer, of course, is that each clause offers only one 'place' for clitics - its second position - but we are now defining second position in terms of the internal structure of the hostword so this restriction doesn't help directly. The crucial point is that any hostword is linked to a verb and no verb allows more than one hostword; so if two clitics are linked to the same verb, they must necessarily share the same hostword.

In our example *juče sam joj ih dao*, the relevant verb happens to be one of the clitics (*sam*, 'I am'), but this need not be so. The verb may be the hostword, like *dolazite* in (52):

(52) Dolazite li često ovamo? (Spencer 1991:354)
you-come Q often here
'Do you come here often?'

or it may be outside the hostword altogether, like *dajem*, 'I give', in (53):

(53) Ja mu ga dajem svaki dan. (ibidem: 353)
I to-him it give every day

'I give it to him every day.'

But although the verb need not be directly involved in the cliticization, it is always relevant because it defines the domain of clitic movement: cliticization is clause-bound. In dependency terms, clitics are always located within the hostword that belongs to the verb on which they depend. In (53), both the clitics depend on *dajem*, 'I give', so their hostword is also linked to this verb.

What is this link between a hostword and its verb? It is not one of the familiar dependencies so we need a new name for it, and we suggest '**anchor**', suggesting that the hostword is 'anchored' to the verb but (like an anchored boat) it still has some freedom of movement. We shall symbolise this link by the label '@', standing either for the 'at' location or for the first letter of 'anchor'. Figure 11 shows part of the structure for two examples, one with the anchor inside the hostword and the other with it outside. (The other dependencies are labelled 'x' in anticipation of the discussion below where we argue that the words are all 'extra' dependents of the hostword.)

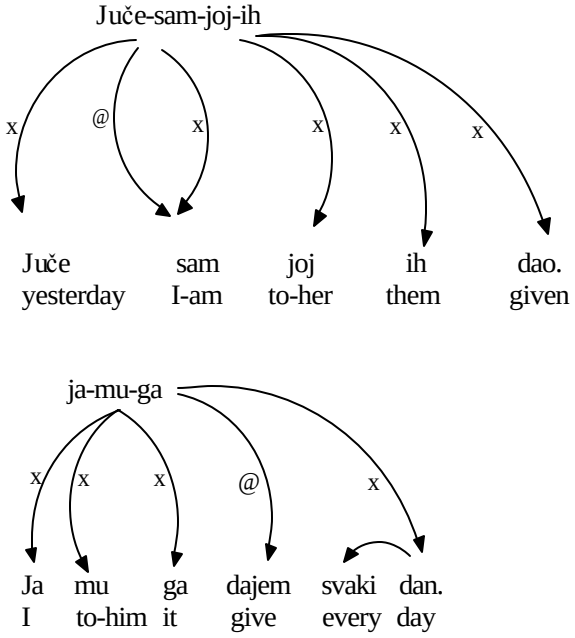

Figure 11

The anchor verb acts as the crucial link between the hostword and its parts, so it is the link between the syntax of ordinary dependencies and the morphology of clitics. We are now ready to explain how the patterns of cliticization apply to the ordinary syntactic structures which we discussed in section 4. In that discussion we argued that SCB clauses

allow a great deal of raising so that dependents of some subordinate words (e.g. verbs depending on auxiliaries) double as dependents of the words on which these depend.

(54) Certain dependents may (or must) also raise - i.e. they depend on the word on which their own parent depends.

We introduced the term 'extra' (symbolised 'x') as the name for the higher dependencies. This extra dependency explained the free order in examples like (45), whose structure is given in Figure 5.

(55) Slatke želim pojesti jabuke. (= (47))
sweet I-want eat apples

What we now suggest is that the same kind of across-the-board raising applies to the hostword, so that all the words which depend on the anchor verb also depend on the hostword.

(56) Every dependent of the anchor verb is also a dependent of the hostword.

Given this assumption, it is very easy to say how cliticization works:

(57) Any dependent of the hostword may also be part of it.

To see how this works, take our stock example, *juče sam joj ih dao*, 'Yesterday I gave it to her.'

- The two pronouns depend (as direct and indirect object) on *dao*, but they raise by (54) to depend on the auxiliary *sam* as well, so every other word in the sentence depends on *sam*.
- By (56), every word which depends on *sam* also depends on the hostword. (Recall that *sam* itself is the hostword's anchor, a kind of dependent, so every word depends on the hostword.)
- By (57), the hostword's suffixes are the two clitics that depend on it, and any other word may act as the host. In this case *juče* was chosen, but it could equally have been *dao*: *Dao sam joj ih juče*.

In the other example, *Ja mu ga dajem svaki dan.* 'I give it to him every day', the anchor

verb is outside the hostword because it is not a clitic and the only slot available to it is already occupied by *ja*. Otherwise the structure is similar, as can be seen from Figure 11 above.

In summary, the hostword selects its parts via the anchor verb, of which all its parts are dependents. This is why SCB clitics can split apparent phrases, such as (7):

(58) [Svoju]$_X$ je baku Ivan poljubio. (= (47))
[his]$_X$ is grandmother Ivan kissed

This is grammatical because *svoju*, as pre-modifier of a noun, may be raised to depend on *zaboravio,* whence it may raise further to *je*, and finally to the hostword *svoju-je*. Similarly the participle can be the host, as in the 'Long Head Movement' examples:

(59) [Poljubio]$_X$ je Ivan svoju baku. (= (8))
[Kissed]$_X$ is Ivan his grandmother
'Ivan kissed his grandmother.'

This is because the participle's dependents raise (obligatorily, in this case) to depend on *je*, leaving the participle free to move without them.

This almost explains how the hostword selects the host: any non-clitic may be the host provided that it depends on the hostword (thanks to raising from the anchor verb). This analysis even applies to many-word host phrases such as *svoju baku*, 'his grandmother' or *slatki čaj*, 'sweet tea', so long as the last word is the phrase's head:

(60) [Svoju baku]$_X$ je Ivan poljubio. (= (6))
his grandmother is Ivan kissed.

Assuming that *svoju* depends on *baku*, in contrast with the reverse dependency in English, *baku* is part of the hostword but *svoju* is not. As an ordinary dependent of *baku*, *svoju* takes its position from it regardless of its role in the hostword.

What the analysis does not explain, however, is the pattern found in more complex examples like (61).

(61) slon sa velikim ušima je spavao pored rijeke.
elephant with big ears is slept by river.
'An elephant with big ears slept by the river.'

The problem with examples like these is that the host does not depend on the anchor word - i.e. *ušima* does not depend on *je*. Examples like this appear to build on the fact that the hostwords may have a pre-dependent as in (14).

(62) [Veliki cirkuski sivi slon sa velikim ušima]$_X$ spavao je
[Big circus grey elephant with big ears]$_X$ slept is
pored rijeke. (=(14))
by river.
'A big grey circus elephant with big ears slept by the river.'

There seem to be two possible treatments of this pre-dependent:

- It is separated prosodically from the hostword, as in (62).
- It is integrated prosodically with the hostword, and its last word acts as host as in (61).

We are not sure exactly how best to allow the second pattern.

Finally, how to explain clitic climbing? It will be recalled that clitics can 'climb' out of the complement of a verb such as 'want', giving examples such as (21, 22):

(63) Ivan ga je htjeo vidjeti. (=(21))
Ivan him is wanted see _
'Ivan wanted to see him.'

(64) Ivan ga je htjeo da vidi. (=(22))
Ivan him is wanted that sees.
'Ivan wanted to see him.'

However we also saw that clause-union raising is possible in very similar circumstances, giving examples like (43, 46):

(65) a. Želim pojesti jabuke. (=(45))
I-want eat apples
'I want to eat apples.'
b. Jabuke želim pojesti.
c. Jabuke pojesti želim.

(66) Koga ne želiš da voliš? (=(46))
who not you-want that you-love

'Who don't you want to love?'

Our hypothesis is that the two phenomena are related: clitic climbing is the consequence of clause union. Thus *ga* and *je* in (63) may be in the hostword anchored to the finite verb *je* because they raise (by clause-union raising) to *htjeo*, 'wanted', whence they raise (again by clause-union raising) to *je* (and finally to the hostword itself). This hypothesis predicts that the restrictions on the two phenomena will be exactly the same, but we have not yet been able to determine whether this is so for all cases.

7 Conclusion

Our WG analysis has solved all the main challenges of SCB cliticization:

- stating the complex mutual ordering of the clitics;
- stating exactly what we mean by 'second position' (without ever referring to the notion 'clause' or any other phrase-level structure);
- ensuring that all the clitics in a clause cluster together;
- allowing clitics to 'split phrases'.

We have had to leave some problems unsolved, especially in the area of interaction between syntactic and prosodic structure. Unfortunately WG has very little to offer in this area at present.

In contrast with the other analyses reviewed in section 2, we treat cliticization as part syntactic, part morphological. Syntactically, the clitics and their host all belong to ordinary syntactic structure, carrying ordinary dependency relations to each other and to other words. Morphologically, they are part of a larger word (the hostword) within which they are organised as stem and suffixes. Most of the work in the analysis is done by apparatus which is needed for ordinary syntax and morphology. Apart from the syntactic dependencies and the morphological structures needed for non-clitics, the only special theoretical apparatus that we have had to introduce for cliticization are these:

- two general word types: Clitic and Hostword;
- a special dependency type: Anchor.

Seen from this point of view, cliticization is a very simple and natural extension of ordinary grammar.

Not surprisingly, however, these simple patterns interact in complex ways. We finish with the complete structure for our main example (Figure 12), plus a bullet-point explanation.

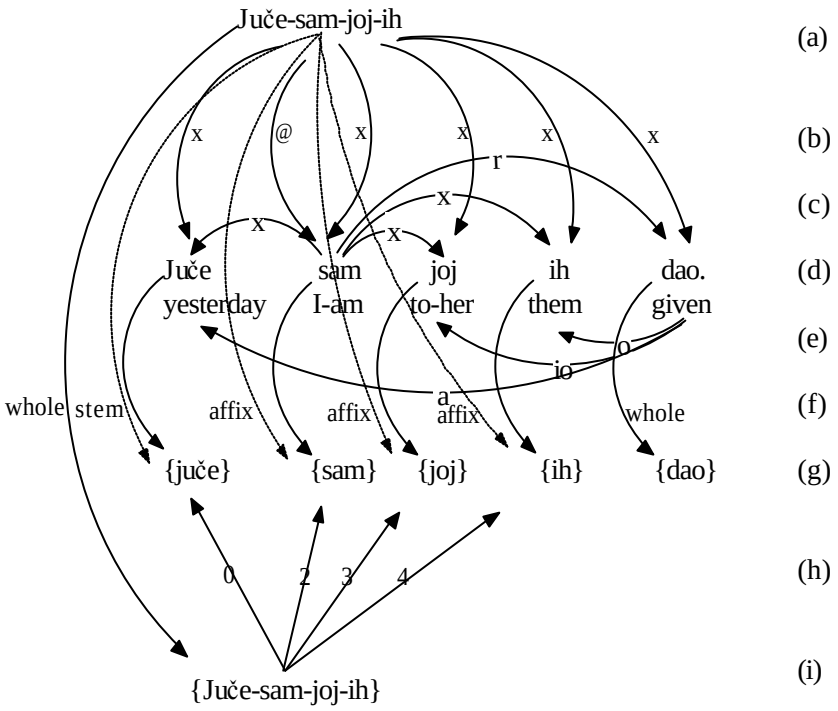

Figure 12

- The words (d) are related syntactically by:
  - the basic dependencies (e) - adjunct, indirect object, object - and in (c) - ‘r’, for ‘sharer’;
  - the raised ‘extra’ dependencies in (c) whereby they depend on the finite verb *sam*.
- The clitics *sam*, *joj* and *ih* require a hostword (a) whose anchor (‘@’) is the finite verb.
- All the words, including the non-clitics as well as the clitics, are extra dependents of the hostword (b).
- The forms (g) are related
  - to the small words by ‘whole’ links shown by the solid lines at (f) so that each word has a morpheme (or in the case of *sam*, a complex form) as its whole;
  - to the hostword by stem and affix links (dotted at (f)).
- The complex form (i):
  - is the whole of the hostword (by the whole link at (f));
  - has the wholes of all the clitics and of the host as its ordered parts (h).

This structure may look complicated, but most of the complexity is due to ordinary SBC syntactic and morphological patterns. If we strip away all these links to leave only the parts which are needed strictly for the cliticization, we have Figure 13, which shows the hostword and its relations to the other words, syntactic at the top of the diagram, and morphological at the bottom.

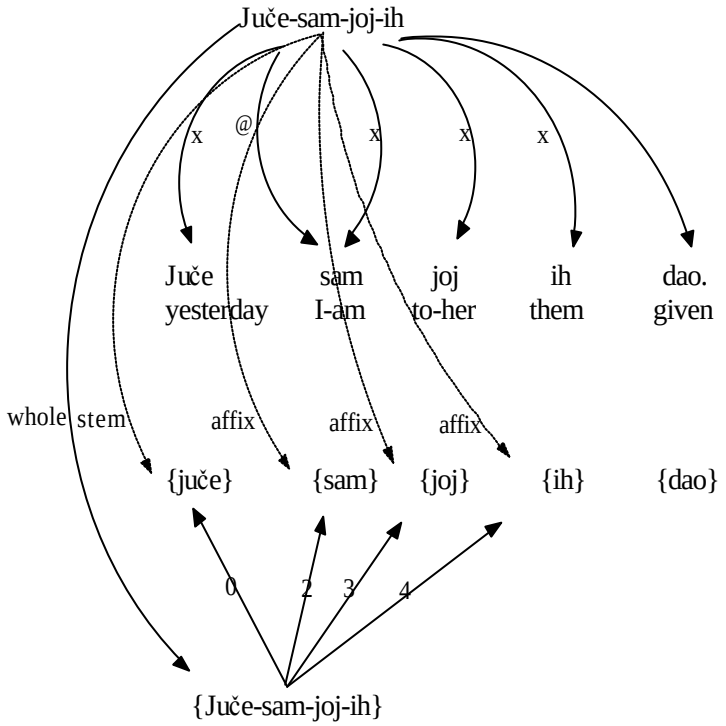

Figure 13

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