Clitic placement in Serbian: 
Corpus and experimental evidence

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1. Introduction

The focus of our paper is the distribution of the so-called “second-position” 
clitics. Languages of this type fall into three classes: those in which the sentential 
position for clitics is after the first word (1W), those in which clitics come after 
the first phrase (1P), and those in which clitics may come either after the first 
word or after the first phrase (1W/1P). This results in the following three-part 
typology:1

<table>
<thead>
<tr>
<th>Type</th>
<th>First Word</th>
<th>First Phrase</th>
<th>Cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type 1</td>
<td>✔</td>
<td></td>
<td>Hittite, Croatian</td>
</tr>
<tr>
<td>Type 2</td>
<td></td>
<td>✔</td>
<td>Czech, Slovenian, Malagasy</td>
</tr>
<tr>
<td>Type 3</td>
<td>✔</td>
<td>✔</td>
<td>Serbian, Ngiyambaa, Warlpiri</td>
</tr>
</tbody>
</table>

Serbian thus emerges as a case of special interest, in that it allows both the first 
word and first phrase placement options. This in turn raises the question of what 
the status of the two placement possibilities are in the grammar of Serbian. That 
is, is the grammar exhibiting genuine optionality, or do the two possibilities 
encode some linguistically relevant difference? Much of the previous literature 
on South Slavic clitics (such as Browne 1974, Franks and Progovac 1994, and 
Progovac 1996, to cite just three examples) seems to at least imply the former – 
the two options are often given identical English glosses – but our own research 
brings us closer to the second conclusion. When the two sentences given below 
are uttered, they not only have very different intonational contours, but are 
felicitous in different contexts.

(2) a. Taj zadatak je veoma važan. 
that task is-Cl very important 
‘That task is very important.’ 
b. Taj je zadatak veoma važan. 
that is-Cl task very important 
‘That task is very important.’
Example (2a), with 1P placement, has unmarked intonation, and is acceptable in “out-of-the-blue” contexts. Example (2b) has a marked contour, and is only acceptable in contexts in which contrastive emphasis on “that” is appropriate. Our claim is that not only do we not find optionality unrestricted by grammar, but that clitic placement is dependent on both syntactic and pragmatic factors.

2. A proposal and its motivations

Current work on Serbian clitics has focused on whether to characterize the second position placement of clitics as being primarily a result of syntactic mechanisms (Franks and Progovac 1994, Progovac 1996), or essentially prosodic in origin (Halpern 1995, Radanović-Kocić 1996, Bošković 2001). Within the prosodic perspective, Zec (2005), further provides a definition of the second position occupied by clitics in prosodic terms, accounting for facts unexplained within the syntactic approach. However, this work also shows that, while important, the prosodic approach alone cannot capture the distribution of clitics, which can only be fully captured by additionally invoking the structural approach.

As implied above, an initial point of failure in many of these accounts is in not recognizing that there are differences among types of sentences in terms of their “markedness”. That is, it is not sufficient to judge the grammaticality of the sentences, but their appropriateness in a given context must also be gauged. Current research has also relied heavily on native speaker judgments that have been culled primarily from previously published work, or from interrogating native speaker linguists. While these are not uncommon methods in theoretical linguistics, it is well worth augmenting the database with other sources, in this case searches of corpus sources and a series of experiments designed to elicit judgments from naïve native speakers. This is essential not merely in order to settle the empirical questions regarding data, but also in regard to the larger theoretical questions concerning the structure of the grammar. If semantic/pragmatic factors indeed play a role in clitic placement, then the problem must be approached from a broader view of the “interfaces” involved.

Our initial hypothesis is that matrix declarative sentences containing second position clitics can be classified into four types, based on whether the initial constituent is an argument or a predicate, and whether the clitic in each case follows the first word (1W) or the first phrase (1P):

(3)  a. Taj zadatak je veoma važan.  1P (Argument)
    ‘That task is very important.’
Clitic placement in Serbian: Corpus and experimental evidence

b. *Taj je zadatak veoma važan 1W
   that is-Cl task very important
   ‘That task is very important.’

(4) a. Veoma je važan taj zadatak. 1W (Predicate)
   very is-Cl important that task
   ‘That task is very important.’

   b. Veoma važan je taj zadatak 1P
   very important is-Cl that task
   ‘That task is very important.’

In the current literature the principal focus is on the argument cases, with very
little discussion of the predicate cases (limited primarily to participle fronting).
The literature also includes discrepant judgments and conclusions. For exam-
ple, the 1W/1P alternation in clitic placement has been claimed to reduce to a
dialectal split between Serbian and Croatian (Anderson 2005: 111).3 To give
another example of data disagreement, Bošković (2001) claims “that it is well
known that very heavy constituents obligatorily delay clitic placement,” citing
the following contrast:

(5) a. Njegovom prijatelju prodali su knjigu.
   his friend.dat sold Cl-are book.acc
   ‘As for his friend, they sold (him) the book.’

   b. Njegovom prijatelju su prodali knjigu.
   his friend.dat Cl-are sold book.acc
   ‘To his friend, they sold the book.’

(6) a. Njegovom najboljem prijatelju prodali su knjigu.
   his best friend.dat sold Cl-are book.acc
   ‘As for his best friend, they sold (him) the book.’

   b. *Njegovom najboljem prijatelju su prodali knjigu.
   his best friend.dat Cl-are sold book.acc

Our consultants find all four examples in (5)–(6) to be grammatical, however, and
we have found sentences like (6b) in our corpus. Thus, there is ample motivation
for both expanding the database of examples and enriching the methodology of
investigation in order to get a clearer picture of the facts and how best to explain
them.

Our study proceeds in two phases. In the first we analyzed corpora of Serbian
prose to assess the validity of our proposed four types of clitic placement. In the
second phase we conducted a series of experiments which served both to verify
the corpus data and to collect “live” native speaker judgments.
3. The corpus investigation

For the corpus study we utilized two sources, the first a corpus from the Serbian daily press compiled by Ebart Media Documentation (www.arhiv.co.yu). This consists of printed media, comprised of more than 700,000 texts, approximately 70 million words. The second corpus consisted of literary prose, the Corpus of Serbian Language (www.serbian-corpus.edu.yu, Kostić 1999). This corpus consist of approximately 11 million words ranging from the 12th century to contemporary times; the contemporary literary prose component from which we drew our samples comprises over 1 million words.

In selecting sentences from the corpora, we limited ourselves to declarative sentences containing auxiliary and pronominal clitics. We excluded main and subordinate clause beginning with question words, and various types of subordinate clauses: relative, temporal, conditional, comparative and consequential clauses. In all these cases there is no second position placement of clitics, and they are thus not relevant to our study. Following these principles of selection, we ended up with a total of 2993 sentences: 1323 sentences from the daily press and 1670 sentences from the literary prose corpus.

We analyzed and placed each of our sampled sentences into the four categories of our classification.

The results tabulated in Picture 1 show an interesting asymmetry between both the argument and predicate cases, and between the first word and first phrase placements. In the argument case, we see a large proportion of the 1P sentences, and a small proportion of the 1W sentences. The situation is reversed in the predicate case, where we find a large proportion of the 1W sentences and a miniscule proportion of the 1P sentences.

![Figure 1. Percent of four sentence categories found in two corpora (percents calculated within a corpus).](image-url)
The results we obtained are striking in several respects. First, we found support for all types of cases we predicted. More importantly, we found that the two types of cases, arguments and predicates, have different default positions for clitics: the “normal” position for clitics in the argument case is after the first phrase, and in the predicate case, after the first word. In fact the proportions of dispreferred cases are very small. This raises the possibility of alternative interpretations for their appearance such as errors in the data base, possibly being at the margins of grammar or even ungrammatical. We had access to an additional corpus of data from spoken Serbian, consisting of 40,000 words. A search of this yielded more tokens of the non-default type: 12 of the Argument/1W case and 1 of the Predicate/1P case. While encouraging, these are still small enough numbers that turning to an additional source of evidence seems warranted. Thus, we turn now to the second phase of our research, the psycholinguistic experiments.

4. Experiments

In order to test the results of the database study we conducted two psycholinguistic experiments. The first experiment was a paper and pencil questionnaire aimed at understanding the production of this language phenomenon, while the second experiment involved a computer based presentation of sentences. The purpose of the second experiment was to explore the on-line comprehension of these sentences.

We conducted both experiments using the same sentences. The sentences included two sets, 60 in each, one for the argument and the other for the predicate case. Within the set of argument sentences, there were three cases, each represented by 20 sentences, with the subject, object, and prepositional phrase arguments in preposed position (Serbian allows scrambling of constituents). An orthogonal further division within the set of argument sentences was the presence of either a determiner or an adjective within the argument noun phrase. The set of predicate sentences was divided into three groups, with 20 sentences in each, representing three types of predicates, adjectival phrase (AP), noun phrase (NP) and verb phrase (VP). The table in (7) summarizes the types of sentences used in the experiments:

(7) Types of sentences used in the psycholinguistic experiments

<table>
<thead>
<tr>
<th>A. Argument</th>
<th>B. Predicate</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>60</strong></td>
<td><strong>60</strong></td>
</tr>
<tr>
<td>Determiner</td>
<td>Adjective</td>
</tr>
<tr>
<td>Subject</td>
<td>10</td>
</tr>
<tr>
<td>Object</td>
<td>10</td>
</tr>
<tr>
<td>Prep Phrase</td>
<td>10</td>
</tr>
</tbody>
</table>
4.1. Experiment 1

Method

Participants: Thirty-eight students from The Department of Psychology, at The Faculty of Philosophy, in The University of Novi Sad participated in the experiment. All of the participants were native speakers of Serbian, and had normal or corrected to normal vision.

Stimuli and design: One-hundred-and-twenty grammatical Serbian sentences were presented in the Roman alphabet. Half of the sentences were of the argument type, and half of the sentences were of the predicate type, with varied structures, as shown in (8). The critical clitic was omitted from each sentence, and the two positions of clitics (after the first word and after the first phrase) were replaced with a line, i.e. a blank to be filled in:

(8) Argument sentence Taj /that zadatak /task veoma /very važan /important

Predicate sentence Veoma /very važan /important taj /that zadatak /task

The dependent variable was participants’ placement of a clitic in one of the two possible positions for each of the two sentence categories.

Procedure: Sentences were printed in a six-page booklet. There were three different random orders of sentences. Each participant was given a booklet with only one random order. Each booklet contained a detailed instruction asking the participant to fill in only one of the two blanks using only one of the listed clitics. The filling in was to be done in such a way to make the sentence sound as common as possible in the participant’s native language. Participants took approximately twenty minutes to complete the task.

Results

The responses revealed a dramatic difference between clitic positions across two sentence categories. While 92.98% of participants placed a clitic after the first phrase in argument sentences, only 2.41% of participants placed a clitic after the first phrase in predicate sentences. Logistic regression performed on participants response revealed that the observed difference was significant: $\chi^2(1) = 1557.16$, $p < 0.0001$ (Picture 2).
4.2. Experiment 2

In experiment 1 we were interested in the differences between the two possible clitic positions in argument and predicate sentences in sentence production. In order to investigate these differences at the level of language perception, or processing, as well, we conducted the second experiment using the sentence list presented in experiment 1 as a starting point.

Method

Participants: Forty-eight students from The Department of Psychology, at The Faculty of Philosophy, University of Novi Sad, participated in the experiment. All of the participants were native speakers of Serbian, and had normal or corrected to normal vision. Participants were randomly assigned to only one of the two experimental blocks.

Stimuli: One-hundred-and-twenty target sentences from experiment 1 along with additional 120 ungrammatical Serbian sentences (control sentences) were presented in the Roman alphabet. The ungrammatical control sentences were constructed to mirror the syntactic structure of the target sentences that were presented in the experiment. Ungrammaticality was achieved by choosing a clitic that fails to agree with the verb.

Design: Sentences were constructed to fit $2 \times 2$ factorial design. Half of the sentences were of the argument type, and half of the sentences were of the
predicate type. For each sentence, the place of the clitic alternated between two possible positions: after the first word, and after the first phrase. Clitic position was balanced in a two block Latin square design. Sentences that appeared with a clitic after the first word in one block, would have a clitic positioned after the first phrase in the second block, and vice versa. This way, all of the sentences appeared with a clitic in both positions, and all of the participants were presented with all of the sentences, and both clitic positions, but none of the participants was exposed to the same sentence twice.

Procedure: Stimuli were presented in a sentence acceptability judgment task. The participants were given instructions to judge whether the sentence appearing on the screen was acceptable in their language. They were told to base their answers on their intuitions as native speakers, and that there would not necessarily be right or wrong answers. Sentences were presented one-by-one, in a random order, on a computer screen. Prior to each sentence a fixation point was presented for 2000 ms. A sentence would remain on the screen until participant’s response, but its duration was limited to 8 seconds. Participants were given twelve practice trials. Sentences appearing in the practice trials were not included in the analyses.

Results

All analyses were conducted on the responses to target sentences. Analysis of reaction times was performed only on responses marking the acceptance of a sentence. Reaction times attached to a rejection of a sentence, as well as reaction times out of the range of ± 2.5 standard deviation units were excluded from the analysis.

Logistic regression of yes/no answers in sentence acceptability task revealed a significant main effect of sentence type: $\chi^2(2) = 232.65$, $p < 0.0001$, a significant main effect of clitic position: $\chi^2(2) = 228.12$, $p < 0.0001$, and a significant interaction between the two: $\chi^2(1) = 181.24$, $p < 0.0001$. Argument sentences with a clitic positioned after the first phrase had higher acceptance probability than argument sentences with a clitic positioned after the first word, while predicate sentences with a clitic positioned after the first word had higher acceptance probability than predicate sentences with a clitic positioned after the first phrase (Picture 3).

Along the same lines, a mixed effect regression of reaction times with participants and sentences as random effects, and sentence type and clitic position as fixed effects, revealed a significant main effect of sentence type: $F(1, 4477) = 5.543$, $p < 0.05$, the main effect of clitic position: $F(1, 4477) = 13.543$, $p < 0.001$, and a significant interaction between the two: $F(1, 4477) = 174.521$,
Figure 3. Mean acceptance rates for the argument (left), and predicate sentences (right) with a clitic positioned after the first word (light grey), and after the first phrase (dark grey) observed in experiment 2.

Figure 4. Mean reaction times for the argument (left), and predicate sentences (right) with a clitic positioned after the first word (light grey), and after the first phrase (dark grey) observed in experiment 2.

$p < 0.0001$. Argument sentences with a clitic positioned after the first phrase were processed faster than argument sentences with a clitic positioned after the first word, while predicate sentences with a clitic positioned after the first word were processed faster than predicate sentences with a clitic positioned after the first phrase (Picture 4).
4.3. Discussion of experiments 1 and 2

The results of experiment 1 clearly establish that, in the argument case, the preferred position for clitics is after the first constituent, while in the predicate case, the preferred position is after the first word. The results of experiment 2 are more nuanced. Reaction times collected in Experiment 2 replicate the preferences found in experiment 1 (Picture 4). However, differences in acceptance probabilities between sentences with clitics after the first word and those after the first phrase are not very dramatic, and in the argument case, the difference is small (Picture 3). The relatively modest differences in high acceptance rates suggest that participants grant grammatical status to all four types of sentences.

Looking more closely at the argument type in both experiments, our results point at a correlation between clitic positioning after the first word and the presence of a (narrow) focus. We show this by presenting the sentences in (9)–(10) used in both experiments. Note that in (9) the sentence initial object argument consists of an adjective followed by a head noun, while in (10) the sentence initial object contains a demonstrative; (9)a and (10)a have clitics after the entire object argument, while in (9)b and (10)b the clitic appears after the first word.

(9) Object: adjective + noun
   a. Loše igrače čemo izbaciti iz prve ekipе. 1st phrase
      bad players will-Cl kick out from first team
      ‘Bad players will be kicked out from the first team.’
   b. Loše čemo igrače izbaciti iz prve ekipе. 1st word
      bad will-Cl players kick out from first team
      ‘BAD players will be kicked out from the first team.’

(10) Object: demonstrative + noun
   a. Ove igrače čemo izbaciti iz prve ekipе. 1st phrase
      these players will-Cl kick out from first team
      ‘These players will be kicked out from the first team.’
   b. Ove čemo igrače izbaciti iz prve ekipе. 1st word
      these will-Cl players kick out from first team
      ‘THESE players will be kicked out from the first team.’

What we found in experiment 1 is that argument sentences are more likely to be completed with the clitic after the first word if the first word is a demonstrative, as in (10)b, than if it is an adjective, as in (9)b, and this difference was statistically significant: \( \chi^2(1) = 30.81, p < 0.0001 \) (Picture 5).
In the sentence acceptance task, in experiment 2, we found that object argument sentences were more likely to be accepted with the clitic after the first word if the first word is a demonstrative, the difference being statistically significant: $\chi^2(1) = 5.47$, $p < 0.05$ (Picture 6).

These findings suggest that the preferred status of demonstratives over adjectives as first word clitic hosts is due to potential differences in information
structure. In particular, a demonstrative (as a deictic and/or specific determiner in a language that does not otherwise have determiners) is more likely to be a point of contrast than an adjective. A broader hypothesis based on this finding is that the argument cases with the clitic after the first word supply a point of contrast in pre-clitic position consistent with either contrastive focus or contrastive topic interpretations. That this effect is found in experiment 2 only with object arguments correlates with their higher focusability.

5. Conclusions and directions for future research

We have clearly established preferred clitic placements in the two types of sentences. In the argument sentences, clitic positioning after the first phrase is more common in the corpus, and exhibits a higher percent of participants’ placements, faster processing, and higher acceptance rates. By contrast, in predicate sentences, clitic positioning after the first word is more common in the corpus, and exhibits a higher percent of participants’ placements, faster processing, and higher acceptance rates. We thus have clear indicators that this is not a case of structural optionality, whether syntactic or of some other sort.

However, factors that affect both preferred and dispreferred clitic placement in the two types of cases are yet to be established, and will be addressed in future research. Correlates of different clitic positionings, both within and across the argument and predicate types, will need to be identified by investigating a broad range of linguistic properties and their potential interactions. Our hypothesis is that clitic positioning is an interface phenomenon, in the broadest sense of the term, with at least prosody, syntax, and information structure contributing to the selection between the competing configurations in both the argument and predicate types. Syntax and its role in clitic positioning has had a central place in previous discussions about clitic placement. In addition, one aspect of the role of prosody has proven to be relevant: the first word, in both the argument and predicate types, has to be characterized in prosodic terms (Halpern 1995, Zec and Inkelas 1990, Zec 2005). We plan to address a further relevant role of prosody that has not yet been studied, namely, the characteristic intonational contours associated with the first word and first constituent cases in both the argument and predicate types. Furthermore, claims in the literature that the domain of clitic placement in Serbian corresponds to an intonational phrase (Radanović-Kocić 1996, Bošković 2001) have not been studied in prosodic terms or substantiated by acoustic evidence.

The least studied facet of clitic positioning is the impact of information structure, yet intuitively we feel that this is where the action is. In particular,
differences between the four cases we have identified may well be correlated with
different discourse conditions between the first word and first phrase positions
within each category.

While the central concern of this paper is the bifurcation into the argument
and predicate cases, the contrast between determiners and adjectives as first
words in the argument case reported in section 4.3 is highly suggestive of the
role for information structure that we envision. This hypothesis will be explored
in future research by conducting further experiments that will directly address the
correlations of the four cases of clitic positioning with differences in information
structures, as well as with differences in intonational contours.

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to the organizers and participants of Linguistic Evidence 2008.

Notes

1. Sources for the typology in (1) are Garrett (1996) for Hittite; Katičić (1986) for
Croatian; Toman (1986) for Czech; Golden and Sheppard (2000) for Slovenian; Paul
(2001) for Malagasy; Donaldson (1980) and Klavans (1982) for Ngiyammbaa; Legate
(to appear) and the references therein for Warlpiri.

2. While Halpern (1995) invokes prosody to characterize clitic placement after the first
word, Bošković (2001) and Radanović-Kocić (1996) characterize the domain of clitic
positioning in prosodic terms.

3. However, both types of clitic positioning are found in Croatian as well as in Serbian.
The claim that clitic placement in Croatian is after the first word is based on pre-
scriptive grammars such as Katičić (1986). As for Serbian, ample evidence for both
types of clitic placement can be found throughout the literature, including this paper.
The claim that clitics follow only the first constituent arise from theory-internal con-
siderations, in which clitic placement is taken to be a result of syntactic movement
only. First word placement is thus taken to be epiphenomenal, a result of so-called
left-branch extractions. Anderson’s claim is based in part on such analyses. For ar-
guments against the purely syntactic approach see Bošković (2001) and Predolac
(2007), among others.
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