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CLITIC CLIMBING WITH DIFFERENT KINDS OF *da*-COMPLEMENTS IN SERBIAN AND THE STATUS OF PROBABILISTIC RULES IN GRAMMAR**

This paper addresses the problem of clitic climbing out of different *da*-complements in Serbian. Clitic climbing refers to a phenomenon where a clitic associated with an embedded clause is pronounced in the matrix clause. In previous literature (Aljović, 2005; Progovac, 1993; Stjepanović, 2004, etc.), various, sometimes contradictory, claims have been made about the (un)grammaticality of clitic climbing out of *da*-complements in Serbian. This paper provides experimental data on the acceptability of clitic climbing out of different kinds of *da*-complements in Serbian. We tested the predictions from Todorović & Wurmbrand (2020) by conducting a formal acceptability judgment experiment involving clitic climbing out of Proposition, Situation and Event-type embedded clauses. Although the results seem to generally follow the Implicational Complementation Hierarchy, the transitions between clause types are rather gradual. Following Bošković's (2004) proposal that clitics surface in the second position in their Intonational Phrase, we analyze the optionality of clitic climbing as being the result of a probabilistic rule at PF which decides whether *da* will induce a prosodic boundary, which takes structural size of the complement clause as one of its factors.

Key words: clitic climbing, *da*-complements, restructuring, acceptability judgments, Implicational Complementation Hierarchy

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1. INTRODUCTION

Clitic climbing (CC) is a phenomenon whereby pronominal clitics introducing the arguments of the verb in the embedded clause are realized in the matrix clause as illustrated with the data from Serbo-Croatian (SC) in (1). In SC, CC is obligatory with infinitival complements of modal, phasal, desiderative, and similar verbs (1).

- | | | | | | |
|--------|--|-----------------------|---------|----------------------------------|---------------------|
| (1) a. | Marija | ga_i | mora | [slušati t_i]. | <i>modal</i> |
| | Marija | him.CL | must | listen.INF | |
| | ‘Marija must listen to him.’ | | | | |
| b. | Marija | ga_i | počinje | [slušati t_i]. | <i>phasal</i> |
| | Marija | him.CL | starts | listen.INF | |
| | ‘Marija is starting to listen to him.’ | | | | |
| c. | Marija | ga_i | želi | [slušati t_i]. | <i>desiderative</i> |
| | Marija | him.CL | wants | listen.INF | |
| | ‘Marija wants to listen to him.’ | | | | |

Some varieties of SC (roughly Serbian and Bosnian) show variation in the types of clausal complements selected by these categories of matrix verbs such that finite, so-called “*da*+present” complements (DPC) are also allowed as shown in (2).

- | | | | | | | | |
|--------|--|---------|-----|-----------------------|------------|------------------------|---------------------|
| (2) a. | Marija | mora | [da | ga_i | sluša | t_i] | <i>modal</i> |
| | Marija | must | DA | him.CL | listen.3SG | | |
| | ‘Marija must listen to him.’ | | | | | | |
| b. | Marija | počinje | [da | ga_i | sluša | t_i] | <i>phasal</i> |
| | Marija | starts | DA | him.CL | listen.3SG | | |
| | ‘Marija is starting to listen to him.’ | | | | | | |
| c. | Marija | želi | [da | ga_i | sluša | t_i] | <i>desiderative</i> |
| | Marija | wants | DA | him.CL | listen.3SG | | |
| | ‘Marija wants to listen to him.’ | | | | | | |

It has been reported that in dialects that exhibit the variation between infinitives and DPCs in embedded clauses, CC is at least marginally possible out of DPCs as well (3) (Aljović, 2005). Anecdotally, however, native speaker judgments of examples such as (3) tend to vary substantially as noted for instance in Todorović and Wurmbrand (2020).

- (3) a. *???*Marija **ga_i** mora [da sluša **t_i]** *modal*
 Marija him.CL must DA listen.3SG
 ‘Marija must listen to him.’
- b. *???*Marija **ga_i** počinje [da sluša **t_i]** *phasal*
 Marija him.CL starts DA listen.3SG
 ‘Marija is starting to listen to him.’
- c. *???*Marija **ga_i** želi [da sluša **t_i]** *desiderative*
 Marija him.CL wants DA listen.3SG
 ‘Marija wants to listen to him.’

Moreover, SC does not allow infinitival complements of verbs that select full-fledged propositions with independent tense (e.g., *say*-type verbs) regardless of clitic position (4a), and CC out of *da*-clauses with these verbs is generally assumed to be blocked (4b) (Wurmbrand et al., 2020). For the purpose of this paper, the label DPC will be restricted to *da*-clauses with dependent (fixed) present tense only so as to distinguish them from fully independent finite embedded clauses of the sort illustrated in (4b). This distinction is widely recognized both in the descriptive and theoretical literature on the topic.

- (4) a. *Petar **ga** je tvrdio [slušati **t_i]**
 Petar him.CL AUX.CL claimed listen.INF
 Intended: ‘Peter claimed to be listening to him.’
- b. Petar (***ga_i**) je tvrdio [da (**ga_i**) sluša **t_i]**
 Petar him.CL AUX.CL claimed_{DA} him.CL listen.3SG
 ‘Peter claimed to be listening to him.’

The data in (3) and (4) give rise to rather concrete empirical research questions and thus provide the impetus for the present study. First, given the reported variation in native speaker judgments of sentences such as those in (3), there is a pertinent empirical question of the actual grammaticality status of CC out of DPCs. Second, since (non-)finite embedded clauses have been argued to come in different sizes (vP/TP/CP) (cf. Wurmbrand et al., 2020), the question is whether the acceptability ratings of sentences involving CC out of DPCs vary depending on the kind or size of DPCs.

Answers to these empirical questions carry significant theoretical implications. If CC out of DPCs is shown to be systematically available in (some dialects of) SC, this will be consistent with the claim that DPCs represent

restructuring contexts (Progovac, 1993; Aljović, 2005). Next, since non-CC configurations with DPCs are uncontroversially available as shown in (2), if it is shown that CC can also take place in these contexts, the question that immediately arises is whether CC in the context of DPCs represents an optional syntactic rule (see Aljović, 2005 for a discussion of this issue). Alternatively, if it is shown that CC out of DPCs is outright ungrammatical, the problem of optionality disappears, but, then, the question becomes why CC is excluded given that DPCs qualify as restructuring configurations on a number of other diagnostics such as Negative Polarity Item licensing or long topicalization (see Progovac, 1993). Finally, if sentences involving CC out of DPCs are judged as neither fully grammatical nor completely illicit, the issue of the status of grammatical structures with gradient or non-categorical acceptability is raised.

In this paper, we report on a formal acceptability judgments survey designed to test the overall acceptability of CC out of DPCs as well as the potential differences in the acceptability of CC out of different types of DPCs following Wurmbrand et al. (2020)'s classification. Our results show that the average acceptability ratings of sentences with CC out of DPCs are relatively low but significantly better in comparison to ungrammatical fillers. Next, CC out of event-type (roughly ν P-sized) complements is judged more favorably than out of situation-type (roughly TP-sized), which are in turn a better source for CC than proposition-type (roughly CP-sized) complements. Finally, CC out of proposition-type is rated significantly better in comparison to ungrammatical fillers.

In the discussion section, we address these findings in reference to the more general theoretical questions outlined above. The analysis of the findings that we put forth consists of several components. With Bošković (2004), we assume that clitic placement is a post-syntactic phenomenon, meaning that the ultimate position of the clitics is calculated at Phonological Form (PF) and clitics are placed in the second position (following the first phrase) within their Intonational Phrase (IP). CC happens when there is no IP boundary between the matrix clause and the embedded clause. If such a boundary is present, clitics will not climb. Crucially, we assume that whether a *da*-clause induces an IP boundary is a non-categorical, phonologically-conditioned matter. The syntactic size of a *da*-clause (ν P/TP/CP) is one factor that influences the likelihood of an IP boundary coinciding with the boundary between the matrix clause and the embedded clause (the probability is positively correlated with the size of the clause). We, thus, conclude that CC out of DPCs is an example of a non-deterministic/probabilistic rule. The existence of such rules implies that a theory of grammar must make room for non-deterministic rules, but based on our data, such

rules could, in principle, be confined to those contexts where seemingly grammatical effects are mediated through phonology. This is a welcome conclusion for models of syntactic variation that assume that Narrow Syntax operates on deterministic rules while probabilistic rules/tendencies in language can occur on the interfaces with the Lexicon and PF (Adger, 2006; Bresnan, 2007, Wasow, 2007; Adger & Smith, 2010; Guy, 2014; Grafmiller et al., 2018; Thoms, 2019).

2. BACKGROUND

The significance of the empirical questions regarding the grammatical status of CC out of DPCs manifests itself in relation to several broader theoretical concerns such as the so-called “second position effect”, the interaction between I-boundaries and clausal boundaries, the existence of optional grammatical rules. In this section, we will expand upon each of these concerns and draw out the connections with the empirical question at the heart of the present study.

2.1. The “second position effect”

The so-called “second position effect” associated with SC clitics has attracted a considerable amount of attention in the literature. In SC, clitics tend to surface after the first phrase in a clause regardless of what the syntactic function of that first phrase is, as illustrated in (5).

- (5) a. Juče **ga** **je** kupio.
 yesterday it.CL AUX.CL bought
 ‘He bought it yesterday.’
- b. Petar **ga** **je** kupio juče.
 Peter.NOM it.CL AUX.CL bought yesterday
 ‘Peter bought it yesterday.’
- c. Kupio **ga** **je** juče.
 Bought it.CL AUX.CL yesterday
 ‘He bought it yesterday.’
- d. Petru **ga** **je** kupio juče.
 Peter.DAT it.CL AUX.CL bought yesterday
 ‘He bought it for Peter yesterday.’

While there have been several attempts to derive this effect purely in syntactic terms (Franks & Progovac, 1994; Čavar & Wilder, 1994; Schütze, 1994;

Progovac, 1996), or from an interaction of syntactic, discoursal and prosodic factors (Zec & Diesing, 2016)¹, we adopt Bošković's (2004) analysis according to which clitic placement is essentially a prosodic phenomenon. Bošković (2004) states the relevant rule as in (6) and this rule is a consequence of the fact that SC clitics are essentially enclitics that "encliticize to the constituent that is right-adjacent to an IP boundary".

- (6) SC clitics occur in the second position in their intonational phrase.

Bošković is explicit about the notion that IPs tend to, but do not necessarily always, correspond to clauses as shown in (7). Fronted heavy constituents (7a), parentheticals (7b), and appositives (7c) can induce an IP boundary within a single clause resulting in what looks like clitic delay or a deviation from the general second position rule but is in reality the product of a mismatch between an I-phrase (a prosodic unit) and a clause (a syntactic unit). Crucially for Bošković's (2004) argument, while they are not in the second position in the clause, clitics are, nonetheless, in the second position within their IPs in all the examples in (7).

- (7) a. Sa Petrom Petrovićem srela **se** samo Milena.
 with Petar Petrović met SE only Milena
 'Only Milena met Petar Petrović'
- b. Znači da, kao što rekoh, oni **će** sutra doći.
 means that as I said they will.CL tomorrow come
 'It means that they will come tomorrow, as I said.'
- c. Ja, tvoja mama, obećala **sam** **ti** sladoled.
 I, your mom, promised AUX.CL you.CL ice cream
 'I, your mom, promised to give you ice cream.'
- (Bošković, 2004)

While the syntactic accounts might not be directly falsified on the basis of the data in (7), it would take significant complications to derive such constructions in syntax. Bošković's (2004) approach, on the other hand, captures both these apparent

¹ Zec & Diesing (2016) show that the clitics tend to surface after the first prosodic word when the clitic host is a predicate, but after the first constituent when the clitic host is an argument. As a reviewer noted, these tendencies may complicate the picture for a purely prosodic approach to clitic placement, but we leave open the possibility that these tendencies are explainable through information-structural factors.

cases of clitic delay and the more typical examples where clitics are located after the first phrase simultaneously based on the prosodic rule in (6).

2.2. *I-boundary and clause boundary with embedded clauses*

Cases of clitic delay in (7) illustrate the possibility of misalignment between a clausal boundary and an I-boundary where there is more than one IP within a single clause. However, the mirror image of this misalignment is also possible whereby more than one clause is found within a single IP. This is arguably what we see with typical CC examples such as those in (1). What happens in such cases is that the clitics that originate within the embedded infinitival clause surface in the matrix clause where they are again in the second position. Given that no I-boundary signals are observed between the matrix clause and the infinitival embedded clause and there is every reason to think that the complex sentences in (1) consist of only one IP, Bošković's (2004) prosodic analysis of the "second position" effect captures these cases straightforwardly. However, the situation with CC out of DPCs sampled in (2–3) is not nearly as straightforward.

One way to approach the data from CC out of DPCs in (2–3) comes from Progovac (1993) who maintains a syntax-based approach. For Progovac (1993), the crucial data point is the distinction between the possibility of CC in cases such as (3) and the lack thereof in (4). She observes that the availability of CC out of *da*-clauses correlates with the availability of independent tense such that those *da*-clauses with independent tense do not allow CC (4) while those with dependent tense allow it. Furthermore, the availability of CC out of *da*-clauses also correlates with several other diagnostics of the presence/absence of a clause boundary such as negative polarity item (NPI) licensing and topic preposing. Matrix clause negation can license an NPI in the embedded clause in (8a) where the *da*-complement is a typical DPC with dependent tense; however, this is not possible with a *da*-complement with independent tense in (8b). Similarly, a typical DPC with dependent tense in (9a) allows what is called long topic preposing where the object of the embedded verb moves to the left edge of the matrix clause under topicalization, but this movement is impossible with *da*-clauses with independent tense (9b).

- (8) a. Ne želim da vidim nikoga.
 not want.1.SG DA see.1.SG no-one
 'I don't want to see anyone.'

- b. *Ne tvrdim da vidim nikoga.
not claim.1.SG DA see.1.SG no-one
'I don't claim that I saw anyone.'
- (9) a. To ne želim [da vidim t].
that not want.1.SG DA see.1.SG
'I don't want to see that.'
- b. *To ne tvrdim [da vidim t].
that not claim.1.SG DA see.1.SG
'I am not claiming that I see that.'

On the basis of these correlations, Progovac (1993) argues that *da*-complements with dependent tense (after matrix verbs such as *želiti* 'want', *moći* 'can', *morati* 'must', etc.) are different from those with independent tense (after matrix verbs such as *tvrditi* 'claim', *reći* 'say', etc.) in that they license the deletion of the higher layers of clausal structure (TP/Infl and CP) at LF because they do not have semantic contributions. This deletion of the higher layers of clausal structure is what allows CC to take place. On this analysis, clitics are always in the second position within their own clause but what counts as a clause is determined at LF following the deletions of functional projections without semantic contributions.

We see three issues with Progovac's (1993) account. The first one is related to the general shortcomings of the syntactic accounts of clitic placement mentioned in Section 2.1. Namely, in contrast to Bošković's (2004) prosodic account which derives both the cases of apparent clitic delay (7) and CC in one fell swoop by exploiting the lack of one-to-one mapping between IPs and clauses, the syntactic accounts require extra computation to derive clitic delay, and in the case of Progovac (1993) structural deletion to account for CC out of DPCs. Secondly, and specifically to Progovac's (1993) analysis, it is difficult to see how LF deletions can be responsible for a phenomenon that has direct consequences for linearization. Whether clitics will be realized in the second position in the matrix clause or in the embedded clause must be decided either in syntax, in which case syntax would have to look ahead into LF to anticipate structure deletion, or in PF, in which case some mechanism of interaction between LF and PF would have to be allowed. Either way, it seems that the account demands some deviations from the standard assumptions about the division of labor between Syntax, LF, and PF. Finally, the deletion of semantically non-contributing layers of embedded clauses does not account for the marginal acceptability of CC out of DPCs, nor the general preference towards

pronouncing clitics in the second position of the embedded clause regardless of the clause type.

2.3. Clitic climbing out of DPCs and the issue of optionality

Another important question that emerges from the data pertaining to CC out DPCs concerns the apparent optionality of this rule. We saw that in SC, CC is obligatory with infinitival complements (1); however, DPCs show a more complex picture because they tend to block CC, at least for some speakers, allowing only structures such as (2), but, at the same time, there is no doubt that at least some speakers allow CC out of DPCs as well (3). One way to interpret this state of affairs would be to say that CC is obligatory with infinitival complements and optional with DPCs. Such an interpretation would, however, have some unwelcome theoretical implications at least within those frameworks that reject optional grammatical rules (cf. Chomsky, 1995).

Aljović (2005) addresses the problem of (apparent) optionality of CC out of DPC in SC, and argues that CC is actually obligatory with *v*P-sized complements and blocked with larger ones (TP and CP). On her analysis, cases in which CC seems optional are cases of structural ambiguity *v*P/TP such that CC happens obligatorily if the embedded clause is realized as a *v*P and is banned if the embedded clause is a TP. She points to data such as (10) which seems to suggest that when structural ambiguity is resolved in favor of a larger structure (TP), CC is blocked. In (10a), with the matrix verb *želeći* ('want'), CC is apparently optional since the clitic can be realized either in the embedded clause or in the matrix clause. However, Aljović (2005) claims that these two options are only available because the embedded clause after this matrix verb can be realized either as a *v*P or as TP (i.e., there is structural ambiguity). When this structural ambiguity is resolved by way of adding exponents of functional projections higher than *v*P, for example, the negative particle in (10b), CC is no longer available (10c).

- (10) a. Mila (**ga**) želi [da (**ga**) vidi]
 Mila him.CL wants DA him.CL see.3.SG
 'Mila wants to see him'
- b. Mila želi [da **ga** *ne* vidi]
 Mila wants DA him.CL not see.3.SG
 'Mila wants not to see him'
- c. *Mila **ga** želi [da *ne* vidi]
 Mila him.CL wants DA not see.3.SG

Intended: ‘Mila wants not to see him’

While Aljović’s (2005) analysis avoids the conclusion that CC out of DPCs is an optional rule, it does not solve the optionality problem completely. Instead of treating CC as an optional rule, she assumes that certain matrix verbs can optionally select a *vP* or a *TP*. This form of optionality is, of course, less of a theoretical issue because it is known that optionality in the domain of argument selection/realization has to be accommodated somehow and it can be seen as a lexical feature rather than a grammatical rule.

2.4. *The typology of (non)-finite embedded clauses*

Wurmbrand et al. (2020) argue for a tripartite split of embedded (non-)finite clauses arranged in a containment structure as in (11) mirroring the three basic domains in the clausal spine (12).

(11) [Proposition [Situation [Event]]]

(12) [CP [TP [*vP*]]]

The containment structure given in (11) comes from the assumption that the semantics of higher types of complements contains and builds upon the semantics of the lower types. Event complements introduce event descriptions without time and world parameters. Situation complements contain existentially closed events enriched with time and world parameters (and potentially mood, modality and aspect information). Finally, Propositions are elaborations of Situations involving speaker and discourse-oriented information (Wurmbrand et al., 2020). Crucially, the type, and consequently the size of the embedded clause, is selected based on the lexico-semantic properties of the matrix verb. Verbs of saying and epistemic modals select Propositions; volitional verbs select Situations; while verbs of attempt (*try*) and phasal verbs select Events.

Consider (13) as an illustration. (13a) contains a Proposition-type complement with full temporal independence (independent tense form + temporal adverbials). (13b) shows a Situation complement with partial temporal independence (temporal adverbials allowed despite fixed present tense). In (13c), the complement shows no sign of temporal independence (fixed present tense and blocked temporal adverbials).

- (13) a. Petar je juče tvrdio da će pročitati knjigu (sutra).
 Petar AUX yesterday claimed DA will read.INF book tomorrow
 ‘Yesterday, Petar claimed that he would read the book tomorrow.’
- b. Petar je juče želeo da pročita knjigu (sutra).
 Petar AUX yesterday wanted DA read.3.SG book tomorrow
 ‘Yesterday, Petar wanted to read the book tomorrow.’
- c. Petar je juče pokušao da pročita knjigu (*sutra).
 Petar AUX yesterday tried DA read.3.SG book tomorrow
 ‘Yesterday, Petar wanted to read the book tomorrow.’

Of central relevance for our purposes here is the claim that the semantic containment structure in (11) manifests itself in syntax whereby complements that are higher in the semantic hierarchy are also syntactically richer, and the three semantic types of embedded clauses correspond to the three core domains of clausal structure. Event complements are syntactically realized as vP; Situation complements are TPs; and Proposition complements are full CPs.

The size of the embedded complement is, of course, expected to be positively correlated with the degree of syntactic independence from the matrix clause, which gives us rather clear predictions when it comes to the availability of CC out of various types of DPCs. These predictions are not discussed in Wurmbrand et al. (2020), but in a related study, Todorović & Wurmbrand (2020) argue that clitic climbing is impossible with what Wurmbrand et al. (2020) call Proposition type complements but is possible with smaller structures noting that native speaker judgments tend to vary.

Wurmbrand et al.’s (2020) typology of embedded clauses motivate the hypothesis that the availability of CC out of DPCs is negatively correlated with the size of the *da*-clause. If the typology that they propose is on the right track, then, one would expect structurally richer *da*-clauses to be less conducive to CC. Specifically, the relevant hypothesis can be stated as in (14).

- (14) a. The acceptability of CC out of Event-type (vP) complements is higher than the acceptability of CC out of Situation-type (TP) complements;
 b. CC is ruled out with Proposition-type (CP) complements because CP constitutes a full phase.

What is of particular interest here is the fact that Wurmbrand et al. (2020) explicitly propose a tripartite typology of clausal complements whereas Progovac

(1993) distinguishes only between two types². Therefore, if the hypothesis in (14) is confirmed, it will provide further empirical support for Wurmbrand et al.'s (2020) tripartite split.

Initial indirect support for the hypothesis in (14) comes from a corpus study of CC out of DPCs in Kolaković et al. (2022). While this study was not designed to test this hypothesis directly, the data that Kolaković et al. (2022) provide suggest that the constructions involving CC with matrix verbs that would be classified as taking Event-type complements under Wurmbrand et al.'s (2020) classification exhibit a larger number of attestations when compared to matrix verbs taking Situation-type complements.

Partial support for (14) also comes from the phonological side. In an experimental study, Milićev & Jakovljević (2017) compared the length of the rhyme of the final syllable before the clausal complement as a potential signal of an I-boundary (so-called 'pre-boundary lengthening') in the contexts of different types of *da*-clauses as well as infinitival complements. They show that the final syllable rhyme is the longest with propositional complements (after verbs of saying) where CC is blocked. Moreover, sentences involving CC after modal verbs show a lesser degree of pre-boundary lengthening when compared to their non-CC counterparts. These results imply that the possibility of CC out of *da*-clauses seems to inversely correlate with signals of an I-boundary between the matrix clause and the embedded clause. While the tendencies shown by Milićev & Jakovljević (2017) are not a clear diagnostic of the exact prosodic structures in question, this correlation is relevant in light of Bošković's (2004) argument that clitics are placed with reference to their IP.

2.5. Summary

In this paper, we follow Bošković's (2004) analysis of clitic placement as a prosodic rule which places clitics in the second position of their IP. So far, the accounts of CC with DPCs have relied on a binary distinction between clauses with independent tense that block clitic climbing and clauses with dependent tense which make clitic climbing possible. We believe that the designation of CC as merely 'possible' with certain (structurally smaller) DPCs is unsatisfactory for the following reasons: a) native speaker judgments of sentences involving CC out of DPCs tend to vary as reported in Todorović and Wurmbrand (2020) requiring a more precise factual (ideally quantitative) statement; b) the apparent optionality of CC with some

² The possibility of a tripartite split is hinted at but not explicitly argued for in Aljović (2005).

DPCs raises conceptual questions typically associated with optional grammatical rules (Aljović, 2005); c) given Wurmbrand et al.'s (2020) tripartite division of embedded clauses associated with syntactic (in)dependence, there are reasons to believe that the possibility of CC might correlate with the size of the complement (Event > Situation > Proposition) in line with the hypothesis in (14).

3. METHOD

In order to test the hypothesis in (14), we designed an acceptability judgment task (Cowart, 1997; Goodall, 2021) in SoSci.

The materials consisted of 48 experimental items and 24 filler items. Each item consisted of two sentences, a sentence serving as preceding context, and a target sentence (an example is given in (15)). The linear structure was the same in all target sentences: NP_[animate] (him.CL) Adv V_M DA (him.CL) V_E PP. Additionally, each target sentence had a non-obligatory clause provided for further context following the main part of the sentence.

(15) Luka i Marko su se posvađali.

(*Luka and Marko had a fight.*) (Situation, CC)

Marko ga ipak planira [da pita za malu pomoć],

Marko him.CL nevertheless plans DA ask for a small favor

ali on ne želi da mu pomogne.

but he not want da him help

'Marko nevertheless plans to ask him for a small favor, but Luka does not want to help him.'

Serbian has a number of pronominal clitics, varying across the categories of person (1, 2, 3), gender (masculine, feminine, neuter), number (singular, plural), case (accusative, dative), as well as potential syntactic function, that are a viable option for testing the acceptability of clitic climbing. For the purposes of this study, we only included *ga* (3SG.M.ACC.CL), as a direct object referring to an animate entity present in the preceding context.

Four matrix verbs were selected for each of the three complement-taking predicate types proposed in Wurmbrand et al. (2020). For each matrix verb we constructed two pairs (CC, no-CC) of sentences with different contexts and different embedded verbs. The resulting 48 experimental items were split into two experimental groups, so that each participant saw one member of each matrix verb pair.

Table 1. Matrix Verbs by Type

Type	Verb	Meaning
Event	<i>Pokušavati</i>	‘try’
	<i>Počinjati</i>	‘begin’
	<i>Nastavljati</i>	‘continue’
	<i>Prestajati</i>	‘stop’
Situation	<i>Planirati</i>	‘plan’
	<i>Odlučivati</i>	‘decide’
	<i>Odbijati</i>	‘refuse’
	<i>Nameravati</i>	‘intend’
Proposition	<i>Verovati</i>	‘believe’
	<i>Tvrditi</i>	‘claim’
	<i>Zaboravljati</i>	‘forget’
	<i>Misliti</i>	‘think’

All target sentences included an adverbial in the preverbal position in the matrix clause. The adverbials in question were *ipak* (nevertheless), *čak* (even), *uporno* (persistently), and *zato* (for that reason). Each of the three ICH classes of verbs had an equal number of sentences with all four adverbials. Our intuition (and that of a reviewer) is that the inclusion of an adverbial in the matrix clause possibly facilitates CC. We have no intuitions with respect to why this might be the case.

Apart from experimental items, we included 24 fillers—12 grammatical and 12 ungrammatical. Ungrammaticality was achieved by inserting superfluous auxiliaries, changing the word order, and incorrect morphosyntactic marking.

The survey was distributed through social networks. There were 87 eligible participants (64 female, 23 male). Ages ranged from 18 to 63 ($M = 24.82$, $SD = 9.21$). 48 participants stated Novi Sad as their place of residence. 44 participants stated that their occupation was closely related to language (student of philology, translator, language teacher, etc.). We refer to this demographic variable as the ‘philologist’ variable hereafter.

In the main part of the experiment, participants were consecutively shown 48 items. Each item consisted of two sentences and a five-point Likert scale of acceptability. The target sentence was marked in bold, and was preceded by the context sentence. The participants’ task was to judge the acceptability of the target sentence on the scale. There were no time limits on item presentation or judgment marking.

Before the main part of the experiment, participants were instructed on what their task was on two sample items. Following the explanation, participants were

assigned to one of the two experimental groups by the SoSci Random Generator, and were consecutively presented with the same four filler items (two grammatical, two ungrammatical). After these items, participants were consecutively presented with the remaining 44 items in a randomized order. After the main part of the experiment, participants were asked to provide demographic information. Finally, a brief explanation of the phenomenon was given.

4. RESULTS

Analysis of the results was done in SPSS (v. 26.0). Friedman's two-way analysis of variance by ranks was used for the purpose of pairwise comparisons of the average scores of respondents across the categories of ungrammatical sentences (F0; $M_{(F0)} = 1.09$), Proposition CC (PCC; $M_{(PCC)} = 1.37$), Situation CC (SCC; $M_{(SCC)} = 1.82$) and Event CC (ECC; $M_{(ECC)} = 2.07$) stimuli. Pairwise comparisons show that in all individual comparisons the variances show statistically significant differences. Individual comparisons are shown in Table 2. The abbreviations for each sample are shown in the parentheses above.

Table 2. Pairwise Comparisons

Sample 1-Sample 2	Test stat.	Std. err.	Std. test stat.	<i>p</i>
F0-PCC	-.517	.196	-2.642	.008
F0-SCC	-1.144	.196	-5.843	<.001
F0-ECC	-1.718	.196	-8.779	<.001
PCC-SCC	-.626	.196	-3.200	.001
PCC-ECC	-1.201	.196	-6.136	<.001
SCC-ECC	-.575	.196	-2.936	.003

Grammatical fillers ($M_{(F1)} = 4.63$) and no-CC stimuli ($M_{(noCC)} = 4.58$) were included in the experiment for control purposes and were not used in further statistical tests.

While pairwise comparisons across categories yield statistically significant differences, the scores for every matrix verb in CC stimuli are distributed quite gradually. Means for each matrix verb in CC items are shown in Figure 1.

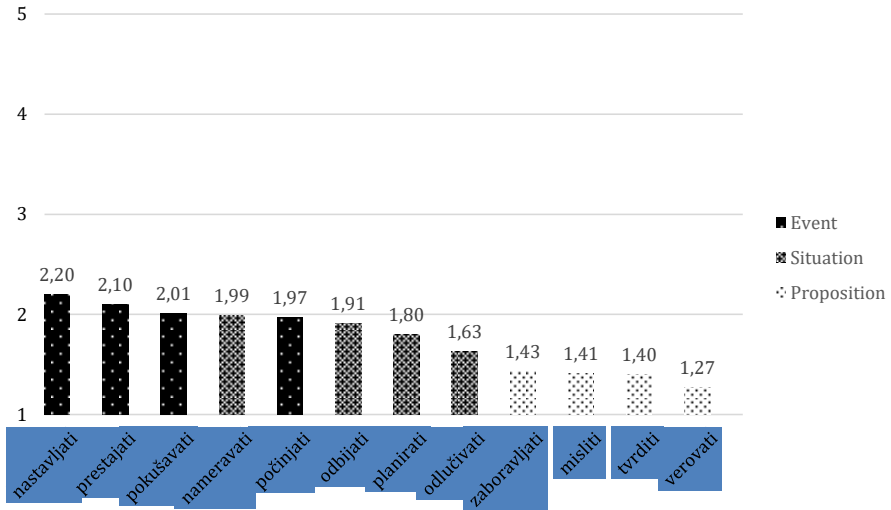


Figure 1. Means for Individual Verbs

Mann-Whitney U test was used to compare the distributions of the averages of individual classes across the demographic variables of gender and philologist. No significant difference was detected across the variables for any of the stimuli classes. p values are shown in Table 3.

Table 3. Mann-Whitney U test for PCC, SCC and ECC across gender and philologist

Null hypothesis	p
The distribution of PCC is the same across categories of gender	.716
The distribution of SCC is the same across categories of gender	.176
The distribution of ECC is the same across categories of gender	.406
The distribution of PCC is the same across categories of philologist	.643
The distribution of SCC is the same across categories of philologist	.723
The distribution of ECC is the same across categories of philologist	.854

5. DISCUSSION

5.1. The acceptability of clitic climbing out of various types of DPCs

Our data shows that all classes of structures involving clitic climbing out of *da*-clauses received relatively low ratings—far lower than their no-CC counterparts or uncontroversially grammatical fillers. However, it also shows that structures with clitic climbing out of *da*-clauses are rated significantly better than uncontroversially

ungrammatical sentences. The average acceptability ratings of clitic climbing out of different types of DPCs are aligned with the hierarchical ordering of complement clause types proposed by Wurmbrand et al. (2020).

While CC out of Proposition-type complements is clearly the most dispreferred out of the three classes, we cannot justify the claim that clitic climbing out of Proposition-type complements is completely ruled out as claimed by most authors so far (Progovac, 1993; Aljović, 2005; Wurmbrand et al., 2020), at least not for all speakers. Our findings are also in contradiction with Aljović's (2005) argument that clitic climbing is obligatory from *da*-complements that show no sign of higher layers of clausal structure (TP/CP), as the acceptability ratings in such items are nevertheless quite low—significantly lower than their no-CC equivalents. CC out of DPCs is never fully acceptable, at least not on a par with uncontroversially grammatical fillers or cases of clitic climbing out of infinitival complement clauses.

Our findings seem to go in line with the complementation hierarchy proposed in Wurmbrand et al. (2020) to some extent, as the average acceptability ratings follow this hierarchy (Event > Situation > Proposition). It is, however, important to note that, while we did find a statistically significant difference in ratings of Proposition-type complements and the other two types, there seems to be no clear cutoff line between them, which goes against their predictions.

A possible way to account for the marginal acceptability of clitic climbing is to assume that clitic placement is computed at PF where the default rule is to place clitics in the second position inside their IP (Bošković, 2004), or perhaps a prosodic constituent of another size. As Milićev & Jakovljević's (2017) findings suggest, whether DA always induces an IP boundary remains an open question. However, the small but systematic differences in pre-boundary lengthening seem to follow the syntactic complexity of the complement. We can say that the place of DA in the clausal spine (ν P/TP/CP) is a significant factor in deciding whether it will induce a prosodic boundary at PF, which in turn determines whether CC will be available.

5.2. *Implications for syntactic variation*

Our findings show that syntactic variation is governed, at least to some extent, by grammar-internal factors. The correlation between the average acceptability ratings of examples involving clitic climbing with the size of the complement (i.e., its place on Wurmbrand et al. (2020) complementation hierarchy) can be seen as another “signature effect” of how this hypothetical universal manifests itself in linguistic variation.

More broadly, our findings and our analysis (if on the right track) lend support to the so-called “hybrid view” of language variation where grammatical rules are divided into categorial/deterministic and probabilistic ones (Adger, 2006; Bresnan, 2007, Wasow, 2007; Adger & Smith, 2010; Guy, 2014; Grafmiller et al., 2018; Thoms, 2019).

One way we could try to advance this line of research is by suggesting, following Adger (2006) and Adger & Smith (2010) (echoing Borer, 1984), that Narrow Syntax operates with deterministic rules and generates categorial constraints which cannot be violated while probabilistic rules are confined to the Lexicon and PF externalization.

Consider Wasow’s (2017) point about the interaction between categorial and probabilistic rules concerning Heavy NP Shift in English. Heavy NP Shift functions as a variable rule with predicative/small clause constructions (1a–a’) with the probability of its occurrence being governed by phonological factors (heaviness); however, it is completely blocked in double object constructions (1b–c).

- (16) a. They consider [a traitor] [anyone who opposes their war policies].
a’. They consider [anyone who opposes their war policies] [a traitor].
b. *I don’t envy [the adulation] [rock stars their fans worship]
c. ??I don’t envy [rock stars their fans worship] [the adulation].

Therefore, probabilistic rules governed by phonological factors apply unless they are blocked by categorial syntactic rules.

If our analysis is correct, and clitic climbing out of DPCs is an instance of a variable (seemingly) grammatical rule mediated through phonology/PF, then, we are dealing with another data point in favor of the “hybrid view” of language variation in which probabilistic rules have their place in linguistic analysis. However, they are located outside of Narrow Syntax (Lexicon or PF) and they are subject to categorial syntactic constraints.

6. CONCLUSION

In this paper, we investigated the acceptability of pronominal clitic climbing out of *da*-complements in Serbian using an acceptability judgment task. We have shown that the acceptability of clitic climbing out of *da*-complements follows the Implicational Complementation Hierarchy proposed in Wurmbrand et al. (2020) in a gradual manner. CC out of Event-type complements was ranked the highest on average, followed by CC out of Situation-type complements, followed by CC out of

Proposition-type complements. Still, the ratings for CC out of all three types were rather low.

Our findings suggest CC out of *da*-complements can be analyzed in terms of Bošković's (2004) proposal that clitics surface at the second position in their Intonational Phrase. Whether DA will induce a prosodic boundary can be regarded as a probabilistic rule computed at PF, with the structural size of the clausal complement as one of the factors.

Future research should try to uncover what other factors might influence the acceptability of clitic climbing. As mentioned in section 3, one of those is possibly the presence of an adverbial in the matrix clause. To get a whole picture on clitic climbing in Serbian, other clitics should be tested as well, especially in order to see whether clitics with different syntactic functions behave the same with regard to clitic climbing. As the availability and use of *da*-complements varies across the Serbo-Croatian sprachraum, clitic climbing should be tested in other regions as well, in order to see if the availability of clitic climbing correlates with other syntactic properties of embedded clauses in Serbo-Croatian varieties.

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