

# Possessive Modifiers in Serbian: Coreference with Clitics and Strong Pronouns

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*Abstract:* On the basis of experimental evidence this paper shows that in Serbian prenominal possessive modifiers modifying a noun phrase in subject position can be interpreted as coreferential with a clitic or a strong pronoun in object position. This finding speaks against a condition B violation in these contexts as has been assumed in previous analyses of Serbian (cf. Despić 2013). It implies that possessive noun phrases in article-languages like English and articleless languages like Serbian may receive a parallel analysis (Universal DP hypothesis, Bašić 2004; Progovac 1998): in both languages, the modifier occupies a position in the noun phrase structure from where it does not c-command out of the noun phrase, leading to free covaluation in these contexts (cf. Reinhart 2006). Interestingly, clitics are more likely than strong pronouns to be interpreted as coreferential with the possessive modifier in our test. This may be attributed to the fact that clitic forms in general are more easily bound in non-c-command configurations. In addition, the discourse conditions in the test, where the possessor represented given information, could have contributed to the fact that it was more likely associated with a clitic than with a strong pronoun.

## 1. Introduction

There are two competing proposals concerning the structure of the noun phrase in article-less languages like Serbian. According to proponents of the Universal DP Hypothesis (Bašić 2004; Progovac 1998), Serbian noun phrases do not differ structurally from the noun phrase in article languages like English. They assume that both Serbian and English project a DP structure and that the difference between the languages concerns the realization of the D-head by an article: in contrast to English, D cannot be overtly realized by an article in Serbian. An alternative view has been proposed by Bošković (2005, 2008), who assumes that Serbian does not project a DP (the Parametrized DP Hypothesis). According to this author, DP-languages like English differ in systematic ways from NP-languages like Serbian with respect to left-branch extraction, adjunct extraction, scrambling, negative raising, multiple *wh*-fronting, and clitic doubling. This proposal assumes that prenominal modifiers are adjuncts to NP as shown in (1).

- (1) [NP Demonstr [NP Poss [NP AP [NP N]]]]  
 (Despić 2013: 240 following Bošković 2005)

According to Despić (2013), the lack of a DP shell in Serbian accounts also for cross-linguistic differences between English and Serbian with regard to binding properties.

In English, object pronouns can be coreferential with a possessive modifier modifying a noun phrase in subject position in the same sentence, see example (2).

- (2) Paul<sub>i</sub>'s brother called him<sub>i</sub>.

Despić (2013) argues that binding as in (2) is not grammatical in Serbian and that the object clitic pronoun *ga* 'him' in sentences like (3a) cannot be coreferential with the possessive modifier *Kusturicin* 'Kusturica's'. According to Despić, the same holds true if the clitic is replaced by a strong pronoun as in (3b).

- (3) a. \*Kusturicin<sub>i</sub> najnoviji film ga<sub>i</sub> je (Despić 2013: 245, ex. 12)  
 Kusturica's latest film him<sub>CL</sub> is  
 zaista razočarao.  
 really disappointed
- b. \*Kusturicin<sub>i</sub> najnoviji film je (Despić 2013: 246, fn.6, ex. ii)  
 Kusturica's latest film is  
 zaista razočarao njega<sub>i</sub>.  
 really disappointed him<sub>STR</sub>  
 [Intended] 'Kusturica's latest film really disappointed him<sub>i</sub>'

Despić (2011, 2013) attributes the ungrammaticality of these structures to the absence of a DP shell in Serbian. He assumes that Serbian prenominal modifiers are adjuncts (cf. also Zlatić 1997) that c-command out of the subject noun phrase, leading to a violation of binding principle B.

However, there seems to be some gradience with respect to the judgments. Some speakers of Serbian find (3b) with a strong pronoun less acceptable than (3a) with a clitic, which corresponds to a general preference for clitic pronouns in neutral contexts in Serbian. From the perspective of the NP account that attributes (3a–b) to a syntactic violation, it is also unexpected that, given the right discourse context, the ungrammaticality of the examples disappears and binding of a pronoun becomes possible in Serbian (Jovović 2020; see section 2).

In this paper, we will take a closer look at constructions like (3a–b) and argue for a unified account of possessive binding in articleless languages like Serbian and article languages like English, in terms of non-c-command and covaluation instead of binding. Based on experimental evidence,

we will show that possessive binding is indeed possible in Serbian. Our investigation concurs with accounts of binding and covaluation, which attribute cross-linguistic and language-internal variation to the properties of the pronominal objects available in a given language.

## 2. Theoretical Background

As mentioned in the introduction, the aim of this paper is to empirically investigate the binding properties of clitics and strong pronouns in Serbian and to discuss their theoretical implications. More concretely, we will pursue the following research questions: a) Is coreference between a possessive modifier modifying a noun in subject position and a (clitic or strong) pronoun in object position possible for native speakers of Serbian? and b) do we find a difference between clitic and strong pronouns with respect to the possibility of coreference with possessive modifiers?

The first research question is based on Despić's proposal, which will be discussed briefly in section 2.1. The second research question follows from observations by Franks (2019), suggesting that different types of pronouns may behave differently with respect to binding. We will discuss these observations in section 2.2.

### 2.1. Binding and (the Lack of) C-Command

The grammaticality of possessive binding in languages like English (as exemplified in 2) has been attributed to the fact that the possessor is not in a configuration to bind the pronoun and therefore no violation of binding principle B arises (cf. Reinhart 2006: 186). According to Kayne (1994), following Szabolcsi's (1981, 1983) analysis of Hungarian possessives, the possessor in English occupies a structural position below DP from where it cannot c-command out of the DP phrase (cf. also Bernstein and Tortora 2005). The lack of c-command also accounts for the fact that possessive binding induces a violation of binding principle A and no violation of binding principle C in English. As shown by Reuland (2005), anaphora are not licensed in the same position as the pronoun in (2) because they have to be bound, and binding by a non-c-commanding antecedent is impossible (Reuland 2005: 5, ex. 15).

- (4) \*John<sub>i</sub>'s mother loves himself<sub>i</sub>.

In the same vein, no violation of condition C arises, although example (5) is of course pragmatically overexplicit.

- (5) John<sub>i</sub>'s mother loves John<sub>i</sub>.

As already mentioned in section 1, based on the supposed ungrammaticality of examples like (3a–b), Despić argues that Serbian pronominal modifiers are adjuncts to NP which c-command out of the subject noun phrase, causing a Binding Principle B violation. However, under Despić's account, it is unexpected that Serbian does not show a condition C violation, as seen in (6a), and that anaphora are not licensed, as shown by (6b). If the possessor were able to c-command out of the noun phrase, one would expect that (6a) is ungrammatical because of a violation of principle C and (6b) is grammatical, because the anaphor is properly c-commanded.

- (6) a. Jovanov<sub>i</sub> papagaj je juče ugrizao Jovana<sub>i</sub>.  
 Jovan's parrot is yesterday bitten Jovan  
 'Jovan<sub>i</sub>'s parrot bit Jovan<sub>i</sub> yesterday.' (Despić's 2013: 256, ex. 45)
- b. \*Jovanov<sub>i</sub> papagaj je juče ugrizao sebe<sub>i</sub>.  
 Jovan's parrot is yesterday bitten self  
 'Jovan<sub>i</sub>'s parrot bit himself<sub>i</sub> yesterday.' (Despić's 2013: 256, ex. 46)

In order to account for these unexpected patterns, Despić (2013: 252) adopts Lasnik's (1989) restricted version of principle C, according to which "An R-expression is pronoun-free." He also refers to an additional syntactic filter (Form to Interpretation Principle (FTIP), proposed by Safir (2004) that compares different derivations containing referential forms (7).

- (7) Form to Interpretation Principle (FTIP, Safir 2004):  
 If x c-commands y, and z is not the most dependent form available in position y with respect to x, then y cannot be directly dependent on x.  
 (Despić 2013: 255)

Following this principle, Despić assumes that (6a) is grammatical because a) (6b) is not available for independent reasons (since the reflexive *sebe* is strictly subject-oriented and can only be anteceded by a local subject) and b) a strong or clitic object pronoun is also not possible (cf. ex. 3a–b). We will come back to examples like (6a–b) in section 4.

## 2.2. Coreferential Interpretation: Clitics vs. Strong Pronouns

LaTerza (2016) questions the assumption that cross-linguistic differences between English and Serbian are due to the absence of the DP in Serbian. She compares the Serbian binding data with those of Slavic article languages like Macedonian and Bulgarian. According to LaTerza, these languages unexpectedly do not pattern with English but rather with Serbian in not allowing for coreference of a possessive modifier and an object pronoun (8a–b).

- (8) a. \*Ivanovijat<sub>i</sub> papagal nego<sub>i</sub> uhapa včera. (Bulgarian)  
 Ivan<sub>POSS.DEF</sub> parrot him bit yesterday  
 [Intended] ‘Ivan<sub>i</sub>’s parrot bit him<sub>i</sub> yesterday.’  
 (LaTerza 2016: 748, ex. 13b)
- b. \*Jovanoviot<sub>i</sub> papagal go<sub>i</sub> grizna (Macedonian)  
 Jovan<sub>POSS.DEF</sub> parrot him<sub>CL</sub> bit  
 nego<sub>i</sub> včera.  
 him yesterday  
 [Intended] ‘Jovan<sub>i</sub>’s parrot bit him<sub>i</sub> yesterday.’  
 (LaTerza 2016: 748, ex. 14b)

According to LaTerza, the similarity between Serbian, Bulgarian, and Macedonian can be explained by assuming that prenominal possessors uniformly raise at LF to the edge of their largest containing nominal from where they c-command the rest of the clause.

However, as shown by Franks (2019), LaTerza’s examples are problematic because they involve strong pronouns which are ruled out in these contexts for independent reasons.

Franks (2019) argues that the ungrammaticality of (8a) in Bulgarian is not a reflex of c-command of the possessive out of the noun phrase as argued by LaTerza, but results from the infelicity of strong pronouns in these contexts, independent of binding (9a). According to Franks (2019: 70), a strong pronoun is only possible if it receives contrastive focus. However, focusing of *nego* in (8a) would block any cataphoric interpretation, “rendering *nego* ...disjoint from *Ivan* independently of binding theory”. If a clitic pronoun is used in contexts like (8a), binding becomes possible (see (9b)).<sup>1</sup>

- (9) a. ?\*Papagalât nego uxapa včera.  
 parrot<sub>DEF</sub> him bit yesterday  
 [Intended] ‘The parrot bit him yesterday.’ (Franks 2019: 70, ex. 17)

<sup>1</sup> According to Franks (2019), the same holds true for embedded possessives as *prijatelj Markove majke* ‘a friend of Marko’s mother’, which are acceptable with the clitic but not with the strong pronoun (i) vs (ii).

- (i) \*[NP [N Prijatelj] [NP Markove<sub>i</sub> majke]] je zagrljo njega<sub>i</sub>.  
 friend Marko’s mother AUX<sub>3SG</sub> hugged him<sub>STR</sub>  
 [Intended] ‘A friend of Marko<sub>i</sub>’s mother hugged him<sub>i</sub>.’ (Franks 2019: 76)
- (ii) [NP [N Prijateljica] [NP Markove<sub>i</sub> majke]] ga<sub>i</sub> je zagrlila.  
 female-friend Marko’s mother him<sub>CL</sub> AUX<sub>3SG</sub> hugged  
 ‘A (female) friend of Marko<sub>i</sub>’s mother hugged him<sub>i</sub>.’ (Franks 2019: 76)

- (9) b. Ivanovijat<sub>i</sub> papagal go<sub>i</sub> uxapa včera.  
 Ivan's<sub>DEF</sub> parrot him bit yesterday  
 'Ivan<sub>i</sub>'s parrot bit him<sub>i</sub> yesterday.' (Franks 2019: 70, ex. 18)

The situation is slightly different for Macedonian, where clitic pronouns have developed into agreement markers (Franks 2009). As a result, strong pronouns are possible if doubled by a clitic, and the Macedonian native speakers consulted by Franks do not distinguish in their judgments between the clitic and the strong form. In contrast to the judgments provided by LaTerza, Franks (2019) considers coreference possible in these contexts. He explains the discrepancy between the judgments as a potential reflex of preferences because a non-coreferential reading is also available.

- (10) Jovanoviot<sub>i</sub> papagal go<sub>i/fj</sub> grizna (nego<sub>i/fj</sub>) včera.  
 Jovan's<sub>DEF</sub> parrot him bit (him) yesterday  
 'Jovan<sub>i</sub>'s parrot bit him<sub>i/fj</sub> yesterday.' (Franks 2019: 72, ex. 14b)

Based on these facts, Franks rejects LaTerza's analysis of the LF movement of the possessive and argues that Bošković's (2012) and Despić's (2013) parametric DP/NP account for Serbian is correct.

Although we will ultimately not follow this argumentation for Serbian, Franks's observations are crucial for our study, because they show that different types of pronouns may behave differently with respect to binding and that the binding possibilities in a given language depend to some extent on the pronominal forms available in that language.

Actually, as shown above, Macedonian and Bulgarian provide evidence for the different behaviour of clitics and strong pronouns with respect to binding relations with possessives modifying a noun in subject position. Serbian seems to show similar restrictions on the occurrence of strong pronouns as exemplified by Franks for Bulgarian (ex. 8a). According to Zec (2002: 243), a strong pronoun is not admissible when an antecedent is mentioned in previous discourse. Only the clitic can be used as the bearer of given information.

- (11) *What does she think of Peter?*  
 a. Poštuje ga.  
 respects him<sub>CL</sub>  
 'She respects him.'  
 b. \*Poštuje njega.  
 respects him<sub>STR</sub> (Zec 2002: 243, ex.81)

That clitics and strong pronouns in Serbian may behave differently with respect to binding is argued also by Jovović (2020), who shows, that given an appropriate information structural context (old information on the subject for clitics (12) and new information on the subject for strong pronouns (13)), binding of both clitic and strong pronouns becomes grammatical in Serbian.

- (12) A: *Directors always admire their own films. Šijan likes all his movies. Dragojević isn't really happy with his recent movies. I don't know about Kusturica—is he more like Šijan or Dragojević?*
- B: *Zapravo, Kusturičin<sub>1</sub> najnoviji film ga<sub>1</sub> je razočarao. Actually, Kusturica's latest movie him<sub>CL</sub> is disappointed. Na ostale je ponosan. On rest is proud 'Actually, Kusturica<sub>1</sub>'s latest movie disappointed him<sub>1</sub>. He is proud of the others.'* (Jovović 2020: 4, ex. 13)
- (13) A: *Who was disappointed by what?*
- B: *Kusturičin<sub>1</sub> najnoviji film je razočarao njega<sub>1</sub>. Kusturica's latest movie is disappointed him<sub>STR</sub> 'Kusturica<sub>1</sub>'s latest movie disappointed him<sub>1</sub>.'* (Jovović 2020: 4, ex. 14)

In contrast to binding of pronouns by possessive modifiers, which becomes possible given the relevant discourse context as shown in (12) and (13), “uncontroversial principle B violations” as in (14a–b) cannot be rescued in the same way.

- (14) *Who disappointed who?/ Who did Kusturica disappoint?*
- a. *\*Kusturica<sub>1</sub> je razočarao njega<sub>1</sub>. Kusturica is disappointed him<sub>STR</sub> [Intended] 'Kusturica<sub>1</sub> disappointed himself.'*
- b. *\*Kusturica<sub>1</sub> je razočarao NJEGA<sub>1</sub>. Kusturica is disappointed him<sub>STR</sub>. [Intended] 'Kusturica<sub>1</sub> disappointed himself.'* (Jovović's 2020: 6, ex. 19, 20a–b)

Based on these findings, Jovović concludes that the ungrammaticality of (3a–b) is not a condition B violation, but relates to the appropriateness of a clitic or strong form in the given context. Hence, according to Jovović's (2020)

argumentation, clitics are illicit when the antecedent is focused and strong pronouns are illicit when the antecedent is a topic.

In view of these observations, together with the evidence provided by Franks (2019) for the differential behaviour of clitics and strong pronouns in Bulgarian, the following question arises: Do Serbian clitic and strong pronouns indeed behave the same with respect to binding by possessive modifiers as argued by Despić (2013)? That there may be differences is acknowledged by the author himself who mentions that when judging the examples with strong pronouns (3b) as compared to the sentences with clitics (3a), “the speakers I consulted ... found examples like (ii) (including a strong pronoun – our addition) equally ungrammatical (*or even more*) ...” (Despić 2013: 146, fn. 6 – our emphasis).

### 3. The Present Study

#### 3.1. Research Questions and Predictions

In order to test empirically if a coreferential reading is indeed possible in Serbian and whether clitics and strong pronouns behave in the same way or differently, we conducted a picture-selection task with 36 native speakers of Serbian. In line with the discussion in section 2, we formulated the following research questions:

Research question 1:

Is coreference between a possessive modifier modifying a noun in subject position and a (clitic or strong) pronoun in object position possible for native speakers of Serbian?

If possessive modifiers are NP-adjuncts and c-command out of the noun phrase in Serbian, we expect that native speakers will not be able to establish coreference between the possessive modifier and the object pronoun. If, on the other hand, the participants allow for a coreferential interpretation, this would speak against the assumption that possessive modifiers c-command out of the noun phrase in Serbian, and in favour of a parallel analysis of possessive constructions as in DP-languages like English. Note that in the latter case it is of course not expected that the speakers will opt for coreference in each and every context.

Research question 2:

Do we find a difference between clitic and strong pronouns with respect to the possibility of coreference with possessive modifiers in Serbian?

Section 2 has revealed that Serbian clitics are in general more easily associated with given discourse antecedents than strong pronouns. Taken together with Franks' (2019) observations concerning Bulgarian and given the methodology of our experiment, in which the potential referents (including the one referring to the possessor) are mentioned in the preceding context, we expect that a clitic may receive a coreferential interpretation more easily than a strong pronoun, if coreferentiality is in principle available.

### 3.2. Participants and Methodology

Thirty-six native speakers of Serbian ( $n = 36$ ), with normal or corrected-to-normal vision participated in this study. All of them gave their consent and agreed to participate in the study voluntarily. The group included both male and female participants (27 female and 9 male), between 19 and 33 years of age (mean age 26.2). The participants were non-linguists and all of them lived in Novi Sad, a city located in the northern part of Serbia. The majority of participants were highly educated: 31 had graduated from a university and five of them had finished high school.

The method used in this experiment was a picture-selection task constructed in the online software IBEX farm, using PennController (Zehr and Schwarz 2018). The dependent variable was the picture choice, with coreferential or non-coreferential interpretation as options. The independent variable was the type of the pronoun: clitic *ga* 'him<sub>CL</sub>' vs. strong pronoun *njega* 'him<sub>STR</sub>'. The stimuli ( $N = 24$ ) consisted of test sentences with either a clitic or a strong pronoun, together with 10 control sentences. A set of items is shown in Table 1.

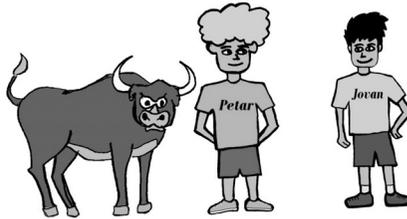
The participants first heard a short context and saw an introductory picture on the first screen. Subsequently, on the second screen, they heard a test sentence (see Table 1) and saw two pictures, one expressing a coreferential

**Table 1.** A sample of test items

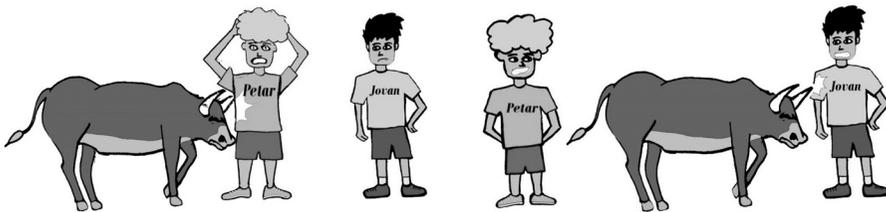
Condition 1: clitic <i>ga</i> 'him <sub>CL</sub> '	<i>Jovanov papagaj ga je ugrizao.</i> Jovan's parrot him <sub>CL</sub> is bitten. 'Jovan's parrot bit him.'
Condition 2: strong pronoun <i>njega</i> 'him <sub>STR</sub> '	<i>Jovanov papagaj je ugrizao njega.</i> Jovan's parrot is bit him <sub>STR</sub> 'Jovan's parrot bit him.'
Control condition: R-expression <i>Jovana</i> 'Jovan <sub>ACC</sub> '	<i>Petrov konj je napao Jovana.</i> Petar's horse is attacked Jovan 'Petar's horse attacked Jovan.'

reading, the other a non-coreferential reading (the position of pictures was randomized).<sup>2</sup> Their task was to choose which of the two pictures matched the corresponding sentence. The procedure is illustrated in Figures 1 and 2.

Participants were instructed to choose the picture they think fit better if both options were possible. Participants were first given two practice items, which were excluded from the analysis. In order for each participant to see only either the clitic or the strong pronoun version of an item, the stimuli were divided into two groups. They were presented to the participants in random-



**Figure 1.** Screen 1: introductory context and picture.  
Context: Here are Petar, Petar's bull, and Jovan. Look what happened!



**Figure 2.** Screen 2: test items and pictures choice.

Test sentence: Petrov bik (ga) je povredio (njega).  
 Petar's bull him<sub>CL</sub> is hurt him<sub>STR</sub>  
 'Petar's bull hurt him.'

Choose the corresponding picture.

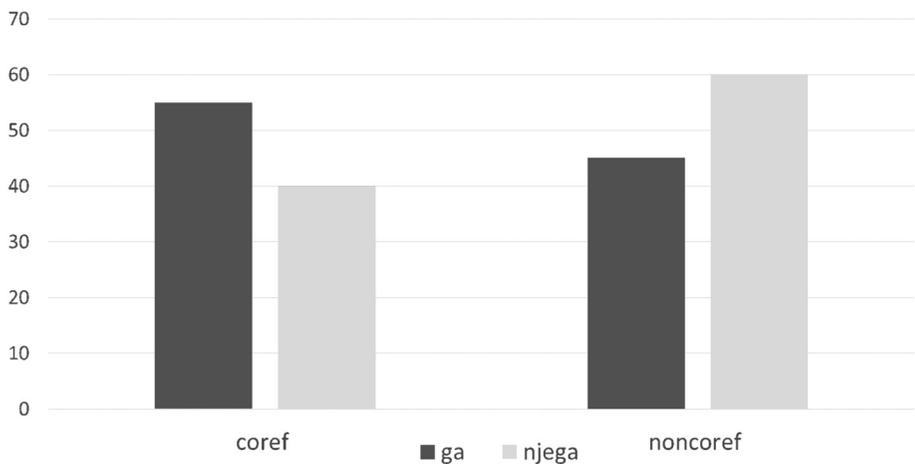
<sup>2</sup> The sentences were read by a native speaker in order to control for the stress on the strong pronoun, i.e., that it had no emphatic stress, which would favour the coreferential interpretation, since it would have a contrastive role, e.g., 'Peter's dog bit HIM, not John.'. The experiment was recorded, and it was checked that all the stimuli were read with a neutral stress.

ized order. We included 10 sentences with an R-expression, where only one reading was possible as control items, in order to check if participants paid attention to the stimuli and if they clicked on pictures randomly. The experiment lasted around 15 minutes.

### 3.3. Results

The thirty-six participants produced a total of 864 test items and 360 control items. For the control items, which only allowed for non-coreferential interpretation, the participants chose the non-coreferential picture with 100% accuracy. This shows that they understood the test and paid attention to the pictures. Our results for the test items indicate that participants chose the picture expressing a coreferential reading in 55% of the examples in which the clitic pronoun was used (240 out of 432 items). Coreference with the strong pronoun was slightly less often chosen, in 41% of the examples (177 out of 432 items). The percentages of (non-)coreference for the clitic and the strong pronoun are illustrated in Figure 3.

For the statistical analysis, the results were introduced in a Generalized Linear Mixed-Effects Regression (GLMER) with choice (coreference/non-coreference) as the dependent variable and condition (strong vs. clitic pronoun) as the independent variable. The trial order was included in the statistical model as a numerical co-variable, and all were treated as fixed effects. Participants and stimuli were included as random factors, in the final GLMER model (For-



**Figure 3.** Choice of coreferential/non-coreferential interpretation with clitic/strong pronoun in percentages

mula: Answer ~ poly(TrialOrder, 2) + IV + (1 | Participants) + (0 + poly(TrialOrder, 2) | Participants) + (1 | Stimuli)). The results indicated that there was only a significant effect of the condition ( $p < .001$ ). There was no statistically significant effect of trial order. The results of the final GLMER are summarized in Table 2.

**Table 2.** Generalized Linear Mixed-Effects Regression (fixed effects results)

Fixed effects:	Estimate	Std. Error	Z value	Pr(> z )
(Intercept)	-0.563	0.283	-1.99	0.046*
TrialOrder	3.432	3.341	1.03	0.304
Condition ( <i>ga</i> )	<b>0.917</b>	<b>0.172</b>	<b>5.32</b>	<b>0.000***</b>

The results in Table 2 show that only condition turned out to have a significant effect on the results, showing that the participants indeed differentiated between strong and clitic pronouns. Even though there are no statistically significant effects of participants as a random factor, there still exist some individual variation among participants. There were two speakers who always opted for one option in both conditions (either always coreference (one speaker), or non-coreference (one speaker)). Some speakers preferred the coreferential (eight speakers) and some the non-coreferential (six speakers) reading in both conditions. However, the overall picture indicates that the choice between coreferential and non-coreferential reading is indeed a question of preference. For most speakers, coreference and non-coreference were an option with the clitic and with the strong pronoun. Most participants favoured the coreferential reading or almost equally allowed for both readings with the clitic but preferred the non-coreferential interpretation with the strong pronoun.

#### 4. Discussion

In section 3.1, we formulated two research questions. First, we wanted to find out whether Serbian native speakers accept coreference between a possessive modifier modifying a noun in subject position and a clitic or strong pronoun in object position. Second, we wanted to investigate whether they differentiate in this respect between clitics and strong pronouns. With respect to the first research question, our results clearly show that coreference is indeed an option in Serbian. Except for one participant, all speakers in our study showed that they are able to interpret a possessive modifier and a clitic or a strong pronoun as coreferential. This result suggests that previous accounts claiming that coreference between a possessive modifier modifying a noun phrase

in subject position and a pronoun in object position represents a violation of binding principle B resulting in ungrammaticality are incorrect. This result speaks against an analysis of the possessive as an adjunct to NP which c-commands out of the noun phrase as proposed by Despić.

The question arises whether the possibility of coreference in Serbian possessive constructions can be accommodated within an NP analysis of Serbian (Bošković 2005, 2008; Despić's 2013) or whether the NP-analysis of Serbian must be rejected in favour of the Universal DP hypothesis (Bašić 2004; Progovac 1998). With respect to the first option, one could assume that the realization of a possessive modifier exceptionally leads to the projection of some functional category above NP in Serbian, to which the possessor covertly moves at LF and which prevents c-command out of the noun phrase in these constructions (15a). This would mean that noun phrases modified by a possessor have a similar structure as the one proposed by Despić (2011: 71) for noun phrases including a quantifier like *mnogo* 'many' (15b), which project a QP above NP and allow for a coreferential interpretation with a pronoun because c-command is blocked and condition B effects disappear.

- (15) a. [FP [F [NP Kusturicin<sub>i</sub> [NP najnoviji [NP film]<sub>i</sub>]]]] ga<sub>i</sub> je  
           Kusturica's      latest      film      him<sub>CL</sub> is  
           zaista razočarao.  
           really disappointed
- b. [QP [Q Mnogo [NP Kusturicin<sub>i</sub>h<sub>i</sub> [NP prijatelja]<sub>i</sub>]]] je  
           many      Kusturica's<sub>GEN</sub>      friends<sub>GEN</sub> is  
           kritikovalo njega<sub>i</sub>.  
           criticized him<sub>STR</sub>  
           'Many of Kusturica<sub>i</sub>'s friends criticized him<sub>i</sub>.'

(Despić's 2011: 71, ex. 82)

However, assuming a structure like (15a) for possessive constructions is just an ad hoc solution and difficult to justify on independent grounds. Also, it remains unclear how this functional category actually differs from a DP with an empty D-head as assumed for an article-language like English for the same constructions (cf. Kayne 1994). In our view, the results of our study, together with the grammaticality of (6a, here repeated as 16a) and the ungrammaticality of (6b, here repeated as 16b) rather speak for a parallel structure of possessive noun phrases in Serbian and English and ultimately in favour of the Universal DP hypothesis.

- (16) a. Jovanov<sub>i</sub> papagaj je juče ugrizao Jovana<sub>i</sub>.  
 Jovan's parrot is yesterday bitten Jovan  
 'Jovan<sub>i</sub>'s parrot bit Jovan<sub>i</sub> yesterday.' (Despić's 2013: 256, ex. 45)
- b. \*Jovanov<sub>i</sub> papagaj je juče ugrizao sebe<sub>i</sub>.  
 Jovan's parrot is yesterday bitten self  
 'Jovan<sub>i</sub>'s parrot bit himself<sub>i</sub> yesterday.' (Despić's 2013: 256, ex. 46)

Recall from section 2 that Despić (2013: 252) accounts for the grammaticality of such structures by adopting Safir's (2004) Form to Interpretation Principle (FTIP), assuming that (16a) is grammatical because neither a reflexive nor a clitic or strong pronoun are possible in this context. Although such economy principles are of course plausible if it comes to explain pronoun choice in different pragmatic contexts (Cardinaletti and Starke's 1999 Minimize  $\alpha$ ; Koster's 1997 Principle of Maximal Specialization), however, it is problematic in the present context because it is unclear how such a principle can circumvent a core structural configuration such as c-command and second, because the reflexive is undoubtedly possible in this position if it refers to the subject parrot (17).

- (17) Jovanov papagaj<sub>i</sub> je juče ugrizao sebe<sub>i</sub>.  
 Jovan's parrot is yesterday bitten self  
 'Jovan's parrot<sub>i</sub> bit himself<sub>i</sub> yesterday.'

The grammaticality of (16a) and the ungrammaticality of (16b) follow without any additional stipulation if one assumed that the possessive does in fact not c-command out of the noun phrase, indicating that Serbian patterns with DP languages with respect to binding.

Concerning our second research question, we indeed find a difference between clitics and strong pronouns with respect to coreferentiality: with clitics, a coreferential interpretation is preferred, whereas strong pronouns are preferentially interpreted as non-coreferential. In contrast to Bulgarian where a coreferential reading is exclusively possible with the clitic but disallowed with strong pronouns (cf. Franks 2019), our participants also accepted a coreferential reading with the strong pronoun. Although clitics in Serbian have not (yet) developed into agreement markers as argued by Franks (2019) for Macedonian, this points towards a parallel to the Macedonian judgments, where both coreferential and non-coreferential readings are possible with both pronominal forms, hinting that the (non-)coreference in these structures entails preference and cannot be related to grammaticality constraints.

Taking our results and the observations in (16a–b) and (17) together, we conclude that the apparent violations of principle B cannot be attributed to c-command by possessive modifiers out of the noun phrase (and a lack of DP)

but call for an alternative explanation. The fact that speakers do not always associate the pronoun with the possessive antecedent in these structures leads us to conclude that the variability of coreference with possessive modifiers does not follow from a grammatical constraint but reflects a preference of the speakers (as argued for the Macedonian data by Franks 2019). Hence, we propose that we are not dealing here with binding but with covaluation in the sense of Reinhart (2000, 2006: 165).

Covaluation is a mechanism of anaphora resolution different from binding by which a pronoun is assigned the value of a discourse antecedent. Reinhart (2006: 165f.) explains the difference between binding and covaluation as follows: in binding configurations, the variable gets bound by the  $\lambda$ -operator, as in (19b), where “the predicate denotes the set of individuals who think that they have got the flu, and the sentence asserts that Lili is in this set.” (Reinhart 2006: 165). In the case of covaluation (see 19c), “the free variable is assigned a value from the discourse storage” (Reinhart 2006: 165). Assuming that we build an inventory of discourse entities which can serve further as antecedents of anaphoric expressions while processing sentences in context (McCawley 1979; Prince 1981; Heim 1982), Reinhart (2006) proposes that in (19c) “we have stored an entry for *Lucie*, and when the pronoun *she* is encountered, it can be assigned this value” (Reinhart 2006: 165).

- (18) a. Lucie didn't show up today.  
 b. Lili thinks she's gotten the flu.
- (19) a. Lili ( $\lambda x$  ( $x$  thinks  $z$  has gotten the flu))  
 b. Binding: Lili ( $\lambda x$  ( $x$  thinks  $x$  has gotten the flu))  
 c. Covaluation: Lili ( $\lambda x$  ( $x$  thinks  $z$  has gotten the flu) &  $z = \text{Lucie}$ )  
 (Reinhart's 2006: 165, ex. 25a–b and 26a–b)

According to Reinhart (2006), the underlying ambiguity becomes visible in elliptical constructions such as (20), where the strict reading (“Max thinks that Lili has gotten the flu”) corresponds to (19c) and the sloppy reading (“Max thinks that he himself has gotten the flu”) corresponds to (19b).

- (20) Lili thinks she has gotten the flu, and Max does, too.

Coming back to our proposal, we assume that coreference in possessive constructions is not determined by binding but by covaluation. The following examples from Despić (2013: 264) point in the same direction. Despić (2013) shows that a pronoun can be coreferential with a possessive modifier in Serbian, given the right context:

- (21) Jovan<sub>i</sub> je razočaran. Njegov<sub>i</sub> omiljeni papagaj ga<sub>i</sub> je  
 Jovan is disappointed his favourite parrot him<sub>CL</sub> is  
 juče ugrizao.  
 yesterday bitten  
 'Jovan is disappointed. His favourite parrot bit him yesterday.'  
 (Despić 2013: 264, ex. 73)

In (21), *Jovan*, *njegov*, and *ga* can refer to the same person, namely Jovan. It is revealing, as pointed out by Despić (2013), that if the sentence is embedded in an ellipsis context (see ex. 22), it only allows for the strict reading but not for the sloppy one,<sup>3</sup> showing that a bound interpretation is not available.

- (22) Jovan<sub>i</sub> je razočaran. Njegov<sub>i</sub> papagaj ga<sub>i</sub> je juče  
 Jovan is disappointed his parrot him<sub>CL</sub> is yesterday  
 ugrizao, dok Markov papagaj nije.  
 bitten while Marko's papagaj is<sub>NEG</sub>  
 'Jovan is disappointed. His parrot bit him yesterday, while Marko's  
 parrot did not.'  
 (Despić 2013: 264, cf. ex. 73/75)

If there is no bound interpretation but only covaluation in examples like (22), it follows that there is no c-command in these configurations (cf. Reinhart (2006: 186), who argues that covaluation is free in such contexts in English because of the lack of c-command).

The question arises of how to account for the differences between strong and weak pronouns. If we compare structures with possessive antecedents to binding configurations with a (non-possessive) R-expression as antecedent and a pronoun in a non c-command position (subordinate clause), we can see that clitics and pronouns behave differently. Namely, clitics allow both strict and sloppy identity readings, while strong pronouns ban sloppy readings (cf. Runić 2014 for Serbian and Stegovec 2019 for Slovenian). In example (23) both the sloppy and the strict readings are allowed with the clitic, i.e., Marija either thinks that the police saw Jovan (strict) or her (sloppy):

- (23) Jovan misli da ga je policija videla i Marija  
 Jovan thinks that him<sub>CL</sub> is police saw and Marija  
 misli takođe.  
 thinks same  
 'Jovan thinks that the police saw him and Marija thinks the same.'

<sup>3</sup> According to Despić (2013: 264) "the only reading available here is that Marko's parrot did not bite John. (strict – our addition) The sentence cannot mean that Marko's parrot did not bite Marko. (sloppy – our addition)"

In contrast, as shown in (24), a strong pronoun in the same contexts only allows for the strict reading (“Marija thinks that the police saw Jovan”) but not for the sloppy reading (“Marija thinks that the police saw her”), indicating that there is **only** covaluation but no binding for this type of pronoun available.

- (24) Jovan misli da je policija videla njega i Marija  
 Jovan thinks that is police saw him<sub>STR</sub> and Marija  
 misli takođe.  
 thinks same

‘Jovan thinks that the police saw him and Marija thinks the same.’

If we suppose that the difference between Serbian *ga* and *njega* in (23 vs. 24) is related to their internal structure, we may conclude that the structural difference between the strong form *njega* and the reduced form *ga* may lead to this difference with respect to their interpretation. In fact, differences in binding between structurally different types of pronouns are not unexpected from the perspective of more recent minimalist accounts of binding, which attribute the complementary distribution of anaphors and pronouns to derivational economy instead of independent binding principles whose status has been challenged by minimalist theory (Hicks 2009; Reuland 2001, 2006; Pesetsky and Torrego 2004, among others).

Based on the observation that the binding of a clitic by an R-expression is possible in Serbian if no c-command applies, whereas strong pronouns in this configuration can only be covaluated, we hypothesise that clitics allow for a coreferential interpretation more easily, while strong pronouns are preferred with disjoint reference. This preference may also relate to the specific discourse conditions in the test situation: Because the protagonists were supplied in the context, the speakers could assume that the possessor was the discourse topic, in which case the use of a clitic would lead to a coreferential interpretation because clitics refer to given information (Zec 2002; Jovović 2020). If the participants do not assume such an interpretation of the possessor, a non-coreferential interpretation with the clitic is preferred. As for the strong pronoun, a coreferential reading is also possible if the speakers assume a contrast between the protagonists given in the introduction, which is also possible in our test. As pointed out by Jovović (2020), the strong pronoun needs to be contrastively focused to be coreferential with the possessor if the antecedent is already mentioned in the discourse, as was the case in our items. Despite the fact that the participants heard the test sentences, which were read without an emphatic stress on the strong pronoun, it might be the case that they still implicitly stressed the pronoun for themselves and allowed for coreference with the strong pronoun in more cases than expected. Some of

the participants actually did when they were asked to explain their choices after the experiment was finished. Thus future studies should control more carefully for the context and for stress in order to find out which factors actually determine the interpretation of the strong and clitic pronouns in these configurations.

## 5. Conclusions

To sum up, our study shows that there are no differences between English and Serbian with respect to the grammaticality of constructions involving a possessive modifying a noun phrase in subject position and a coreferential pronoun in object position. In contrast to previous accounts by Despić (2011, 2013), our study provides experimental evidence that coreference is indeed possible in these constructions in Serbian just like in English. This speaks against the assumption that Serbian possessive modifiers are NP-adjuncts that c-command out of the noun phrase, leading to violations of binding condition B. To the contrary, there has to be a functional category above the possessive preventing it from c-commanding out of the noun phrase. This speaks in favour of the Universal DP hypothesis. We have seen that clitics are preferentially interpreted as being coreferential with the possessor while strong pronouns tend to be interpreted as non-coreferential. In our view, this finding relates to the fact that the two forms take different kinds of discourse antecedents: discourse topics in the case of the clitic, new information antecedents or contrast in the case of strong pronouns (as shown by Jovović 2020). Hence, when the speaker interprets the possessor in terms of given information (more likely in our test), he/she admits coreferentiality with the clitic. But when the speaker interprets the possessor in terms of new information or contrast (less likely in our test), this induces non-coreferentiality with the clitic but a coreferential interpretation with the strong form. The fact that both interpretations are equally available with both pronominal forms and that the choice relates to the discourse conditions shows that we are not dealing with binding (and c-command) but rather with covaluation in the sense of Reinhart (2006).

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