

Sanja R. Raković<sup>1</sup>

# ON THE IDENTIFICATION OF NULL POSSESSORS OF RELATIONAL NOUNS IN SERBIAN

*Abstract: This paper researches potential sources and mechanisms of the identification of null possessors (possessive-pro) of relational nouns in Serbian. It also deals with possible differences in the possessive-pro identification process between children and adult speakers. For these purposes, we conducted a pilot study in the form of a self-paced comprehension experiment. There were 30 participants, 15 children (9–10 years old) and 15 adult speakers (23–37 years old). The data were analysed qualitatively and quantitatively (in percentages). The obtained results, even though modest in size, tentatively suggest that the source of the possessive-pro identification in Serbian may be sought in the aboutness topic of the utterance, with the mechanism being coreference, rather than syntactic binding. This would imply that the identification of possessive-pro is not a strictly syntactic phenomenon. Rather, it should be placed the syntax-discourse interface domain. Additionally, we observed a qualitative and quantitative difference in the identification of pro in children compared to the adult speakers. This is in line with previous research which argues that the acquisition of null elements at the adult level happens relatively late.*

*Key words: relational nouns, pro, possessives, identification, syntax, discourse.*

## 1. Introduction

In the past decades much research in the generative enterprise has focused on the syntax and semantics of null elements. The main reason for this interest may be best expressed in Chomsky's (1981:p.55) remark that null elements „can hardly be determined inductively from observed overt phenomena, and therefore presumably reflect inner resources of the mind. If our goal is to discover the nature of the human language faculty, then these elements offer particularly valuable insights.“

In a nutshell, null elements lack phonological form but are assumed to be present in the syntactic derivation with morphosyntactic (e.g. verbal inflection) and

<sup>1</sup>The author is a PhD candidate at the Faculty of Philosophy, University of Novi Sad. Email address: sanja.rakovic9@gmail.com.

semantic (interpretative) effects. The most famous example of a null element is the so-called little *pro*, which constitutes the source of the *pro*-drop parameter. Namely, in certain languages, such as Serbian, the subject of the clause can be phonologically omitted (1a) while the same is impossible in a language such as English (1b). Nevertheless, by assumption, there is a *pro* in the subject position in Serbian with features [3.p.sg] whose effect we can see on the verbal inflection.

- (1) a. *pro* Dolazi ovde svaki dan.  
pro comes<sub>3.SG.</sub> here every day  
'He/she comes here every day.'  
b. \*(He) comes here every day.

*Pro*-drop parameter then constitutes a division between those languages that employ null subjects, i.e. *pro*-drop languages, and those which do not have this option in their grammars, i.e. non-*pro*-drop languages.

However, the *pro*-drop language group is not entirely homogenous. There seems to be a division between *pro*-drop languages with respect to the restrictiveness of the use of null subjects. While some languages allow null subjects with all persons and tenses (e.g. Italian, Serbian), some languages, on the other hand, allow them only for some persons and some tenses (e.g. Finnish, Hebrew). The former group of languages is usually recognised as full *pro*-drop languages while the latter is termed partial *pro*-drop languages.

Another phenomenon that seems to be associated with the *pro*-drop parameter is the availability of null possessors of relational nouns. Namely, relational nouns constitute a unique, hybrid (Belaj, 2018:p.126), type of nouns which semantically and syntactically require a possessor forming an inalienable construction with it. Relational nouns are by definition those nouns that refer to body parts, family members and part-whole relations.

In non-*pro*-drop languages, the possessor of relational nouns ought to be overtly expressed (2a), while in non-*pro*-drop ones it need not be (2b) (cf. (1)). Due to the semantic and syntactic requirements of relational nouns, it is assumed that in constructions such as (2b) the possessor is present in the structure as a null possessive pronoun - *pro*.

- (2) a. He met \*(his) uncle yesterday.  
b. Sreo je *pro* ujku juče.  
met<sub>3.SG.</sub> is *pro* uncle yesterday  
'He met his uncle yesterday'

It remains unclear, both in the case of null subjects and null possessive pronouns, how the null element receives interpretation, i.e. its reference. Modesto (2000:p.68) terms the process of the null element receiving interpretation identification and defines it as in (3).

(3) Identification is the process of furnishing a null pronoun with a denotational index.

Yet, another point of debate is whether the identification occurs in narrow syntax, in pragmatics (discourse) or in the syntax-pragmatics interface. One of the aims of this paper is to suggest an answer to this question, at least for Serbian.

With respect to the identification of null possessors in the case of relational nouns, Rodrigues & Dal Pozzo (2017:p.464) argue that the null possessor is interpreted exclusively anaphorically (i.e. it is identified by the c-command NP) only in partial *pro*-drop languages and that the process of identification is completely syntactically determined, proposing the hypothesis in (4).

(4) In full *pro*-drop languages, null pronouns (as opposed to overt pronouns) prefer having local c-commanding antecedents, while null pronouns in partial *pro*-drop languages must have a local c-commanding antecedent.

From theoretical perspective, they argue that the observed difference arises due to different syntactic nature of the null element in full *pro*-drop vs partial *pro*-drop languages. Namely, they argue that in partial *pro*-drop languages, the null possessor obeys Principle A of the Binding theory (Chomsky, 1981:p.188) whereas in full *pro*-drop languages it obeys Principle B. In other words, the null possessor is an anaphor in partial *pro*-drop languages, but a pronoun in full *pro*-drop languages.

Therefore, the purpose of this study was to experimentally test the identification of *pro*-possessors of relational nouns in Serbian, a full *pro*-drop language, in two groups of speakers – children and adults. The experiment represents a partial and adapted replication of Rodrigues & Dal Pozzo's (2017) study.

#### 1.1 Research questions:

- How is possessive-*pro* identified in Serbian (the source and the mechanism)?
- Does the identification process occur in syntax only?
- Is there a difference in the identification process of possessive *pro* between children native speakers of Serbian and the adult ones?

The obtained results tentatively suggest that the source of identification of possessive-*pro* should be sought in the aboutness topic of the utterance. Therefore, it seems to happen in the syntax-discourse interface in Serbian through the process of coreference. Interestingly, we observed a discrepancy between the adults' and

children's data in that the children identify the possessive-*pro* in a slightly different manner than the adults. This finding is potentially valuable both for null element and language acquisition studies. The presented findings still should be taken with reservation due to the modest sample size. They could preferably serve as a starting point for further, empirically broader and methodologically more rigid, studies.

The rest of the paper is organised as follows: Section 2 offers the review of the previous research and the key theoretical concepts needed for the proposed analysis. The research design and methods are presented in Section 3, while the results are shown in Section 4. Section 5 proposes the analysis and discusses it in the context of theory and previous research. It offers guidelines for future research as well. Finally, Section 6 concludes the paper.

## 2. Literature Review

### 2.1 Relational nouns

Relational nouns are nouns which prototypically denote body parts, part-whole relations, and family relations. It has been argued (Vergnaud & Zubizarreta, 1992; Barker, 1995; Belaj, 2018 i.a.) that these nouns semantically and syntactically obligatorily require possessors (5). For example, in order to be *an uncle*, one must be *someone's uncle*, just the same as *a hand* or *a leg* must belong to someone, i.e. they cannot exist on their own.

- (5) a. I haven't seen \*(my) uncle since last Christmas.  
b. John broke \*(his) leg two days ago.

However, it has been noted that in *pro*-drop languages, such as Serbian, the possessors of relational nouns can stay covert (Rodrigues & Dal Pozzo, 2017; Modesto 2000) (6a). Moreover, in certain instances the use of an overt possessor is felicitous only in the case of contrastive focus (Sabina Halupka-Rešetar p.c.) (cf. 6b).

- (6) a. Opržila sam ruku.  
burned-I<sub>F</sub> am hand<sub>ACC</sub>  
'I burned my hand.'  
b. Opržila sam svoju ruku.  
burned-I<sub>F</sub> am self<sub>POSS</sub> hand<sub>ACC</sub>  
'I burned my own hand.' (and not yours)

In sum, the relationship between the relational noun and its possessor is termed inalienable possession since it cannot be detached. The inalienable relation is syntac-

tically reflected in such a way that relational nouns obligatorily require an external argument. Thus, even though the null possessor is not pronounced in (6a), we have every reason to assume that it is present in syntax and LF due to the semantics of the relational nouns and the data from non-*pro*-drop languages which show that the possessors of relational nouns are indeed obligatory (cf. 5).

## 2.2 The syntax and interpretation of null elements – the case of *pro*

Null elements are argued to be semantic variables in all languages (Modesto, 2000; Rizzi, 1986; Cinque, 1990 i.a.). This entails that they lack a denotational index which is necessary for their interpretation at LF (semantics). This is important because if an expression does not have a denotational index it will not have a reference (Modesto 2000:p.68). Hence, there is a need for every null element to undergo some kind of identification process in order to be assigned a denotational index and a reference, i.e. to be interpretable at LF.<sup>2</sup>

However, there is a dispute in the literature over what the source of the denotational index might be for the null elements (in the remainder of the paper – *pro*) or, in other words, what the mechanism of the identification process is.

We can distinguish between two basic approaches on the issue. On the one hand, there is a view that the identification process is entirely determined in the syntax through A'-binding and c-command relations or agreement (Modesto, 2000; Rodrigues & Dal Pozzo, 2017). On the other hand, there is a view that the identification process occurs in the interaction of syntax and discourse, i.e. in the syntax-discourse interface (Shormani, 2017) and that *pro* is identified by coreference with an aboutness topic (i.e. NP in the Spec-TopP is the source of identification).

Moreover, the proponents of the exclusively-syntax theory argue that the mechanisms and the sources of the identification of *pro* differ between partial and full *pro*-drop languages.

The source of the identification of *pro* in full *pro*-drop languages is the Agr-head and the mechanism is agreement between the *pro* in the subject position and the Agr-head, which is morphologically expressed as a verbal inflection.

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<sup>2</sup>In contrast, expletive elements are not assigned denotational index and therefore do not have any reference at LF. For example, the English expletive subject *there* does not have any reference (i) and is inserted into the structure only to satisfy the strong EPP feature in English.  
(i) There is a cat there.

In partial *pro*-drop languages the source of *pro*-identification is the NP in the A'-position which binds the *pro*, and this can be formalized as in (7) (Aoun & Li, 1993:p.205).

(7) At LF, variables must be bound by the most local potential A' binder.

However, in discussing the mechanism of *pro*-identification in *pro*-drop languages, Shormani (2017) rightly points out that we should distinguish between valuation and interpretability of features. Valuation of features (achieved through syntactic agreement) is required by the syntax (cf. Pesetsky & Torrego, 2007), while the interpretability of features (e.g. *pro*-identification) is imposed by discourse.

In other words, the valuation of features does seem to, to some extent, contribute to the interpretation of *pro*, e.g. if the verb is inflected for 3.p.sg.m. features we expect that the *pro* will be identified with an NP.sg.m. However, this is not yet full interpretation. The final interpretation occurs in the discourse where the *pro* receives the denotational index and reference. For example, in example (1a), the syntactic agreement (the valuation of the features) gives only the information that the subject *pro*, is 3.p.sg., but we are not provided with the reference of the *pro*. The reference is provided by the discourse, which is usually the topic of the discourse.

### 2.3 Previous study

Rodrigues & Dal Pozzo (2017) conducted a study which tackled the issue of *pro*-identification in Italian, Brazilian Portuguese and Finnish languages. Importantly, the design of the present study is partially based on that study. Their hypothesis is that *pro* is of different nature in partial and full *pro*-drop languages as stated in (4) repeated here as (9).

(9) In full *pro*-drop languages, null pronouns (as opposed to overt pronouns) prefer having local c-commanding antecedents, while null pronouns in partial *pro*-drop languages must have a local c-commanding antecedent.

It seems to be implied in (9) that *pro* is fundamentally different in partial vs full *pro*-drop languages. We can infer that, in their account, the features of the *pro* in partial *pro*-drop languages are [+anaphoric, -pronominal], while in full *pro*-drop languages they could be [-anaphoric, + pronominal] or even [+anaphoric, +pronominal].

In standard Government and Binding Theory<sup>3</sup>, four types of null elements with *sui generis* characteristics are assumed to exist. As it can be seen in Table 1 (adapted

<sup>3</sup> In this paper, we will be mostly using terminology from the Government and Binding phase of the Generative enterprise, e.g. NP for all nominal expressions instead of DP. However, the analysis and

from Chomsky, 1981; Kosta, 1995; Truswell, 2014) each null category, save for PRO, has its overt counterpart. The null elements are labelled in binary terms [+/-] in regard to their anaphoricity and pronominal status.

null	Overt	anaphoric	pronominal
NP-traces	Anaphors	+	-
PRO	∅	+	+
<i>wh</i> -trace	R-expression	-	-
<i>pro</i>	Pronouns	-	+

**Table 1:** Classification of null and overt elements and their binding properties

Looking at the table and aligning it with Rodrigues & Dal Pozzo's hypothesis we are forced to conclude that, in case their analysis is correct, the null element in partial *pro*-drop languages bearing the features [+anaphoric, -pronominal] would be an NP-trace, which would further imply that the *c*-commanding antecedent in their analysis is actually a moved NP.

However, since their analysis does not include formalism of this kind, we do not want to draw any final conclusions, but only to point out certain possibly problematic aspects of it.

The account proposed by Modesto (2000), another exclusively-syntactic account, also makes a distinction between mechanisms of *pro*-identification but in a different way. It achieves so by focusing on the difference between the sources of the identification of *pro*. In partial *pro*-drop languages, *pro* is identified through A'-bounding, while in full *pro*-drop languages the *pro* is identified through the agreement relation with Agr-head which is morphologically expressed in the form of verbal inflection.

This account also makes certain inferences about the theoretical status of *pro* in partial *pro*-drop languages which are similar to the ones in Rodrigues & Dal Pozzo (2017). Namely, if *pro* can be bound than its status as a pronoun is problematic since according to Principle B of the Binding Theory<sup>4</sup> (Chomsky, 1981:p.188), pronouns must be free (i.e. not bound) in their binding domain.

Thus, Both Modesto's (2000) and Rodrigues & Dal Pozzo's (2017) accounts are problematic when it comes to the theoretical status of *pro*. One way to solve this

the conclusions surely could be reformulated in the Minimalist terms. However, given the pilot nature of the study, the focus was put more on the commonalities between the languages and general findings than on the technical details.

<sup>4</sup> Binding theory consists of three principles with the aim to account and constrain distribution of different types of NPs, their mutual relations as well as the ways in which they refer to extralinguistic entities (Büring 2005).

issue is to posit that in partial *pro*-drop languages this null element is not *pro*, but a null anaphor – an NP-trace. The other possibility, contra the mentioned authors' accounts, is that in both partial and full *pro*-drop languages, the null element is a pronoun, which would exclude binding as an option of identification since it would go against Principle B.

The relationship between the NP which is the source of the identification and the *pro* could then be coreference, a discourse phenomenon. Such approach to the problem would imply that the source of the difference in the interpretation of *pro*, i.e. *pro*-identification, between partial and full *pro*-drop languages should be sought in the syntax-discourse interface, more precisely in the realizations of topics in the respective groups of languages (cf. Shormani 2017).

### 3. Methods and Materials

We conducted a self-paced comprehension study in the form of a Power Point presentation which was presented on a laptop. The stimuli were presented in the audio form in order to control for the intonation. The comprehension questions were in the written form. There were 12 test items and 12 fillers. The stimuli were randomized. The testing was done in quiet places – empty classrooms or offices. The participants listened to the audio recordings via headphones. First, the participants were familiarized with the task through two test items. The participants' task was to listen to the stimuli and then go to the next slide on which there was written a question related to the stimuli they had just heard. They were allowed to go back to listen to the stimuli one more time if they needed to. Every question started with the possessive pronoun *Čiji/a/e* 'Whose' and enquired about the possessor both in the test items and fillers. In fillers, the possessors were R-expressions and were explicitly mentioned in the filler items. The participants were asked to say the answer to the question out loud so that it can be recorded and noted for later analysis. The stimuli were randomized. The participants were tested one at a time and the duration of the experiment was approximately 10-15 minutes per participant.

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The null and overt elements in Table 1 are subjects to different binding principles (ii). Therefore, NP traces and anaphors obey Principle A, PRO obeys Principles A and B, *pro* and pronouns obey Principle B and *wh*-trace and R-expressions obey Principle C.

(ii) Binding Principles as in Chomsky (1981:p.188):

A. An anaphor is bound in its binding domain.

B. A pronominal is free in its binding domain.

C. An R-expression is free.

### 3.1 Participants

The data used for this study were being collected between 2022 and 2024. Two groups of participants were involved in the elicitation of the data – children and adults. There were 15 adults (23–37 years old) and 15 children (9–10 years old) in the sample. All the adult participants signed an informed consent for the use of the data they provided for the scientific purposes only and completed a short questionnaire about their age and living place. The children's parents provided signed informed consents for the participation of their children in the experiment. The children were from two primary schools in the Srem district of Serbia and the school principals also signed the permissions for conducting the experiments in their schools.

### 3.2 Experimental Design

Two main factors were manipulated – the type of the configuration (in Rodrigues & Dal Pozzo's terminology *c*-command and locality) and the type of the possessor (null or overt). There were two sentences for each factor, plus additional 4 sentences for the *c*-command condition (2 for overt possessor factor and 2 for null possessor factor) (Table 2).

C-command		Locality	
overt	Null	overt	Null
2 + 2	2 + 2	2	2

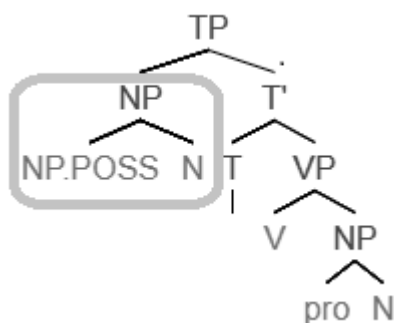
Table 2. The distribution of the test items according to the manipulated factors

These additional sentences were needed because Serbian, like Finnish, has two positions for nominal possessors – prenominal and postnominal positions. The prenominal position is usually termed adjectival possessors. In Serbian, they bear the recognizable *-ov* (m.) / *-in* (f.) suffixes and decline like adjectives (10a). The postnominal possessor *-ov* position can be defined as the genitive possessive construction, where the possessor bears the genitive case and follows the noun (10b) (see Šarić (2018) and Srđanović (2021) for detailed morphological and syntactic analyses of Serbian possessors).

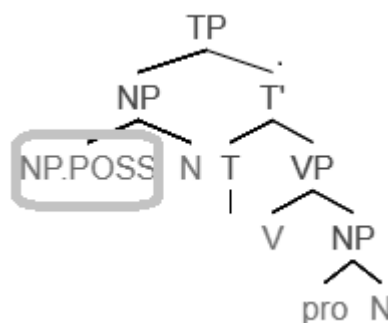
- (10) a. mamina košulja  
 mum<sub>POSS.NOM</sub> shirt<sub>NOM</sub>  
 `mum's shirt`

- b. košulja moje mame  
 shirt.<sub>NOM</sub> my.<sub>GEN</sub> mum.<sub>GEN</sub>  
 'my mum's shirt'

The main rationale for the so-called c-command condition was to have two possible antecedents for the null possessor – the c-commanding NP (Graph 1), or the non-c-commanding (possessive) NP (Graph 2). The question was which of these will be chosen as the source of the identification of *pro*.



Graph 1. The c-commanding antecedent of *pro*



Graph 2. The non-c-commanding antecedent of *pro*

Since in Serbian the possessor can appear both in the pre and post nominal positions, there were 2 sentences with a prenominal antecedent possessors and 2 sentences with the post-nominal antecedent possessors (2 sentences had masculine antecedents and 2 had feminine ones).

Linearly, the possessor NP is closer to the null possessor in (13) than in (12), so in this way we tested whether the proximity of the antecedent possessor NP may have an effect on the interpretation of the null possessor. This effect was not observed.

- (12) Vojkanov doktor je otrovao *pro* strica.  
 Vojkan.<sub>POSS</sub> physician is poisoned *pro* uncle  
 'Vojan's friend has poisoned his uncle.'
- (13) Drugarica Katarine Anđelić je previla *pro* povređenu nogu.  
 friend.<sub>FSG</sub> Katarina.<sub>FSG.GEN</sub> Andjelic is bandaged *pro* hurt leg  
 'Katarina Anđelić's friend has bandaged her hurt leg.'

The rationale for constructing the test items in the *c*-command condition with overt pronominal possessors was the same as in the case of null possessors as shown in Graphs 1 and 2, but now instead of *pro* there was an overt pronominal possessor (14). The indices show the antecedent possibilities.

- (14) Anina<sub>i</sub> majka<sub>j</sub> je očešljala njenu<sub>ij</sub> kosu.  
Ana<sub>POSS</sub> mother is brushed her hair  
'Ana's mother brushed her hair.'

Next, in the so-called locality condition, the rationale was to again construct two possible antecedents for the *pro* (15a) and overt pronominal possessor (15b), but the two antecedents were now in two different clauses. Thus, the possible antecedents were the subjects of the subordinate and of the main clauses. The question was whether the possessor will choose as the source of identification the closer NP (i.e. the subject of the subordinate clause) or the farther NP (the subject of the matrix clause).

- (15) a. Ujka Toma<sub>j</sub> je rekao da je Bata<sub>i</sub> izneverio *pro*<sub>ij</sub> ćerku.  
uncle Toma is said that is Bata let down *pro* daughter  
'Uncle Toma said that Bata let down his daughter.'  
b. Bata<sub>j</sub> je rekao da je Drakče<sub>i</sub> ograbao njegov<sub>ij</sub> obraz.  
Bata is said that is Drakce scratched his cheek.  
'Bata said that Drakce had scratched his cheek.'

There were 2 sentences for each factor, 1 sentence had masculine antecedent subject and 1 had feminine antecedent subject. The example sentences for each condition as well as an example of a test item are given in the Appendix.

Being a pilot study, the present research possesses certain shortcomings. One of the limitations of the present study is that the number of the test items is rather small. However, this was the case mainly due to certain practical reasons – the time and place that was available for conducting the experiment was rather limited as well as the children's natural attention span. The other limitation is the modest number of participants. Therefore, both the empirical results and the conclusions of this study should be taken with reservation. Future studies should amend for the present shortcomings.

#### 4. Results

The results are presented in percentages of responses per each condition and for each test item individually with the summative results at the end of the tables.

In Table (3), we can see that both children and adults identified possessive *pro* with the c-commanding antecedent. However, it is evident that a greater percentage of adults identified *pro* with the c-commanding antecedent than the children did. It seems that for children both options were almost equally possible. Furthermore, TI 1<sup>5</sup> seems to be an outlier for both children and adults and we will tackle this issue in the Analysis sub-section.

	C-commanding antecedent	Non-c-commanding antecedent	
Children	17%	83%	TI 1
Adults	50%	50%	
Children	50%	50%	TI 2
Adults	100%	0%	
Children	83%	17%	TI 3
Adults	100%	0%	
Children	67%	33%	TI 4
Adults	83%	17%	
Children	54, 25%	45, 75%	Total
Adults	83, 25%	16, 75%	

**Table 3.** Interpretation of pro-possessors in the c-command condition in children and adults

Secondly, children coreferenced the overt pronominal possessor almost exclusively with the non-c-commanding antecedent (Table 4) (i.e. the possessor in the antecedent NP). Interestingly, with adults, we can observe almost the inverse situation to the one in Table (3). The adults seem to prefer the non-c-commanding possessor as the overt pronominal possessor coreference, but both options seem to be available in the adults' grammar. In this condition, TI 8 seems to be an outlier, the issue that will be addressed in the next sub-section.

	C-commanding antecedent	Non-c-commanding antecedent	
Children	0%	100%	TI 5
Adults	0%	100%	
Children	0%	100%	TI 6
Adults	50%	50%	

<sup>5</sup> For the actual examples of each test item, see the Appendix.

Children	17%	83%	TI 7
Adults	50%	50%	
Children	80%	20%	TI 8
Adults	67%	33%	
Children	24, 25%	75, 75%	Total
Adults	41, 75%	58, 25%	

**Table 4.** Interpretation of overt possessors in the c-command condition in children and adults

In the locality condition, children again assigned almost equal possibility for the identification of the possessive-*pro* both to the local and non-local antecedents, with, interestingly, a slight preference for the non-local, i.e. further NP-antecedent.

	Local antecedent	Non-local antecedent	
Children	33%	67%	TI 9
Adults	83%	17%	
Children	50%	50%	TI 10
Adults	100%	0%	
Children	41,5 %	58, 5%	Total
Adults	91,5 %	8, 5%	

**Table 5.** Interpretation of *pro*-possessors in the locality condition in children and adults

The results for the interpretation of overt pronominal possessors in the locality condition are virtually the same for both children and adults. In this condition, the non-local coreference is unequivocally preferred.

	Local antecedent	Non-local antecedent	
Children	17%	83%	TI 11
Adults	33%	67%	
Children	0 %	100 %	TI 12
Adults	0 %	100 %	
<b>Children</b>	<b>8,5 %</b>	<b>91, 5 %</b>	<b>Total</b>
Adults	16, 5%	83, 5%	

**Table 6.** Interpretation of overt possessors in the locality condition in children and adults

## 5. Analysis and Discussion

The empirical findings of this study, albeit rather limited in its size and only descriptively presented, suggest that a *pro*-possessor in Serbian is more likely to be identified with the structurally closer *c*-commanding antecedent. On the other hand, the overt pronominal possessor is more likely to be identified with the structurally farther and/or non-*c*-commanding antecedent. However, the observed difference in the interpretation of *pro*-possessor seems to be more exaggerated in adults than in children. Namely, children seem to give virtually equal chances to *c*-commanding and non-*c*-commanding NP antecedents as the identifiers of null possessor. Even though the sample size is rather small and the study is pilot in nature we can still capture some tendencies and form possible hypotheses to be explored in future studies.

One possible theoretical explanation for the observed empirical results is that the identification of the null possessor - *pro* is a joined product of syntax (the proximity and structural relation of *pro* to the *c*-commanding NP) and pragmatics, i.e. discourse. In that case, there would be two conditions that need to be satisfied in order for the identification of *pro* to converge: syntactic and pragmatic. Firstly, the empirical data seem to show that *pro* is more likely to pick up as its antecedent the syntactically closer *c*-commanding NP than the structurally farther one. However, this rule does not seem to be enough for the successful identification of *pro* since there are exceptions to it. Therefore, we hypothesize, on the basis of Shormani (2017), that a pragmatic condition is also needed. This condition states that *pro* is identified with the most salient NP in the discourse, i.e. the aboutness topic. This would suggest that the interpretation of the *pro*-possessor is an interface issue and the result of the syntactic and pragmatic factors.

Hence, in line with Shormani (2017), we could propose a working hypothesis that the final role in the process of *pro*-identification plays discourse. This implies that the identification of possessive *pro* does not occur fully in narrow syntax (albeit the syntactic configuration may and does give potential clues for its interpretation) but in the discourse.

Another possible argument for this line of thinking, might be provided by the outliers. In the instances of the observed outliers, for the antecedent of the possessive-*pro* the syntactically expected NP was not chosen. We can tentatively argue that in these instances, for whatever reasons, the most salient topic for the participants was the unexpected one (e.g. the non-*c*-commanding for adult participants). The reasons for choosing the unexpected antecedent might be due to

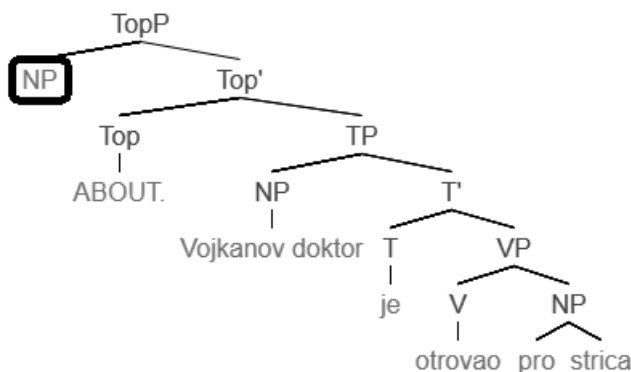
the overall meaning of the utterance or its implications, which were not controlled for. This would imply that discourse factors can override the syntactic ones. These explanations are surely speculative in nature but possibly form hypotheses for future empirical research.

Another phenomenon which could support the interface stance is explicated in (16), an example provided by Predrag Kovačević (p.c.). In this example *pro* can refer both to a general possessor (the silent topic) such as *people's* or *costumers'*, or to the *hairstresser's* (the overt topic). Given the discourse factors and the world knowledge, we would most likely identify *pro* with the former option. However, what it seems to show is that possessive *pro* is identified with the topic of the discourse, which can be provided either by the syntax or by the discourse.

- (16) Frizer seče *pro* kosu.  
 hairstresser cuts *pro* hair  
 "A hairstresser cuts people's hair."

In order to elaborate on this proposal, let us look at example (17). Without going into the fine-grained structure of the clauses and/or mechanisms of topic control, which is beyond the scope of this paper, we propose that for example (17), whose tree structure is sketched in Graph 3, there are three possible options of *pro*-identification.

- (17)  $Vojkanov_i$  doktor<sub>j</sub> je otrovao  $pro_{i,j,k}$  strica.  
 Vojkan<sub>POSS</sub> physician is poisoned *pro* uncle  
 'Vojkan's uncle has poisoned his uncle.'



Graph 3. Tree representation of the *pro*-identification by TopP

The first option is that the whole NP in the spec-TP is the aboutness topic which would then be situated in Spec-TopP. Let us say that we are gossiping about Vojkan's physician and then we say that he (the physician) poisoned his uncle. The other option is that we are gossiping about Vojkan and the mystery who poisoned his (Vojkan's) uncle, and we say that the physician poisoned Vojkan's uncle. The third option is that we are talking about a third person's uncle, which is the silent topic of the conversation, and then we say that Vojkan's physician poisoned the uncle we are talking about. If the *pro*-identification were solely the issue of narrow-syntax we would expect only one reading, while the availability of multiple readings suggests that discourse factors might be involved in the process.

Another indication that the discourse aboutness topic may be the source of identification for (possessive) *pro* might come from the children's *pro*-identification responses in the locality condition. Namely, children assigned a slight preference to the non-local source (the subject of the main clause) of the *pro*-identification. One potential explanation for this might be that the children understood the first subject NP as the topic of the discourse and then identified it with the possessive *pro*. On the other hand, it seems that the adults paid more attention to the syntax and identified *pro* with the closest NP or that they understood the closer NP as the aboutness topic. This hypothesis is to be tested in future studies.

Therefore, we propose, as the most promising avenue for further research of the phenomenon of *pro*-identification, that *pro* is a pronoun in syntax, at least for Serbian and, according to Principle B, it cannot be syntactically bound but must remain syntactically free. Nevertheless, it can have an antecedent, i.e. be coreferenced with an NP which is overtly present in the clause, or covertly (silently) present in the discourse. We propose that in both cases, the NP which is the source of the possessive-*pro* identification is in the Spec-Topic position and this NP can either be overt or silent. In this way the topic NP has the scope over the whole clause.

Additionally, while the sample is rather small and the experiment design has some drawbacks, the obtained result point to an interesting discrepancy between children's and adults' grammars. This potentially gives the positive answer to the third research question. The results seem to point to the differences in the understanding of the topic of an utterance between children and adults.

Namely, while the adults seem to equalise topic with the NP in the subject position, children seem to be more liberal in this respect and do not rely on the syntactic structure alone when determining the topic of the utterance. This is in accordance with the previous literature which reports that children acquire the adult-like interpretation of null elements quite late compared to the acquisition

of other grammatical elements (Sorace et al., 2009; Shin & Cairns, 2012; Chien & Wexler, 1990). This implies that the acquisition of discourse factors and syntax-discourse interface is a rather complex matter which should be viewed as a more of a continuum than all-or-nothing situation. However, this issue is to be potentially researched further in the future.

Finally, the discourse-centred analysis of *pro*-identification is aligned with the principles of language economy. Namely, the null element is preferred over the overt element whenever possible as formulated in the Avoid Pronoun Principle (Chomsky, 1981) since they are assumed to be lighter in terms of derivation not possessing any morphophonological form (Hornstein, 2007). The possibility of avoiding the pronoun is determined by the discourse and it shows how pragmatically conditioned is the use of null elements, which is also shown in the quote (18) from Chomsky (1981:p.65).

(18) [The Avoid Pronoun Principle is] a subcase of the conversational principle of not saying more than is required, or might be related to a principle of deletion up to recoverability.

Overall, the phenomenon of possessive-*pro* identification seems to be rather complex, including various factors and levels of representations. Therefore, it needs to be studied in a more controlled environment, with a larger set of empirical data, possibly providing wider context instead of a single utterance in order to obtain clearer findings.

In sum, this paper, albeit on the basis of limited empirical data, challenges strictly syntactic accounts of the identification of the possessive-*pro* (Modesto 2000; Rodrigues & Dal Pozzo, 2017). Instead, we propose that possessive-*pro* receives identification in the interplay between syntax and discourse with discourse playing the key role in line with Shormani (2017). Specifically, we propose that the aboutness topic, which can be silent (present in the discourse but not phonetically expressed) or overt (e.g. the subject NP), is the source of the possessive *pro*-identification in Serbian. Further, more controlled and larger in sample, studies are needed to corroborate or refute these findings.

Lastly, in light of the first two research questions expressed in 1.1 and the obtained results we propose the following hypothesis:

(19) In Serbian, a full *pro*-drop language, the source of the identification of the *pro*-possessor in inalienable constructions is the aboutness topic and the identification occurs in the syntax-discourse interface through coreference.

Additionally, there are several methodological shortcomings in this study, which may have impacted the obtained results. Firstly, although all the participants orally

confirmed that they are native speakers of Serbian, this question was not one of the formally listed ones in the questionnaires. Secondly, the number of the test items and participants is rather modest, which decreases the reliability of the results. This study has also shown that for the proper study of the *pro*-identification phenomenon, single utterances may not be enough, but a wider context should be included in the design of the test items. Finally, a deeper and software-aided statistical analysis would offer deeper insights into the co-dependence of the variables. Possible future studies should amend these shortcomings.

## 6. Conclusion

This paper challenges the view that the process of identification of possessive-*pro* in Serbian must be performed in the narrow syntax only. We instead propose a hypothesis, on the basis of the empirical data, that the process of identification happens in the syntax-discourse interface through the mechanism of coreference. Precisely, the source of the identification of the possessive-*pro* in Serbian seems to be the aboutness topic of the utterance. Furthermore, quantitative and qualitative differences in the assignment of topic or/and the identification of possessive-*pro* have been observed between children and adults. It seems that children rely on the syntactic cues in identifying the reference of *pro* less than adults.

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Сања Р. Раковић

## О ИДЕНТИФИКАЦИЈИ НУЛТОГ ПРИСВОЈНОГ ДОПУНСКОГ МОДИФИКАТОРА РЕЛАЦИОНИХ ИМЕНИЦА У СРПСКОМ ЈЕЗИКУ

### *Резиме*

Овај рад истражује могуће изворе и механизме идентификације нултог присвојног допунског модификатора релационих именица у српском језику (енг. *possessive-pro*), као и потенцијалне разлике у овом процесу између деце и одраслих говорника. Спроведено је пилот-истраживање у форми експеримента разумевања вођеног сопственим темпом. Учествовало је укупно 30 испитаника, 15 деце (9-10 година старости) и 15 одраслих испитаника (23-37 година старости). Подаци су анализирани квалитативно и квантитативно (процентуално). Резултати, иако невелики обимом, сугеришу да потенцијални извор идентификације нултог присвојног модификатора у српском језику може бити тема израза путем механизма кореференције. Импликација ових резултата јесте да идентификација нултог допунског модификатора не може бити стриктно синтаксички феномен, већ да се одвија у интеракцији синтаксе и дискурса. Наиме, синтакса може да понуди одређене конфигурације, али се крајња идентификација, тј. додељивање референце догађа у односу на именичку фразу која представља тему израза, а која може бити изражена или неизражена. Такође, уочена је квалитативна и квантитативна разлика у идентификацији допунског модификатора између деце и одраслих говорника. Овакви резултати у складу су са претходним истраживањима, која показују да се усвајање нултих елемената на нивоу одраслих говорника одвија релативно касно.

► **Кључне речи:** релационе именице, нулти допунски модификатор, присвојни придеви, идентификација, синтакса, дискурс.

## Appendix

### Test Items

#### 1. C-command condition

##### 1.1 Null possessor

- TI 1) Vojkanov doktor je otrovao *pro* strica.  
Vojkan.<sub>POSS</sub> physician is poisoned *pro* uncle  
'Vojan's friend has poisoned his uncle.'
- TI 2) Komšija Svetislava Anđelića je razbio *pro* glavu.  
neighbour.<sub>M</sub> Svetislav.<sub>GEN</sub> Andjelic is bumped *pro* head  
'Svetislav Andjelic's neighbour has bumped his head.'
- TI 3) Milicina<sup>6</sup> drugarica je povredila *pro* ruku.  
Milica.<sub>POSS</sub> friend is hurt *pro* arm  
'Milica's friend has hurt her arm.'
- TI 4) Drugarica Katarine Anđelić je previla *pro* povređenu nogu.  
friend.<sub>F</sub> Katarina.<sub>GEN</sub> Andjelic is bandaged *pro* hurt leg  
'Katarina Andelic's friend has bandaged her leg.'

##### 1.2 Overt pronominal possessor

- TI 5) Anina majka je očešljala njenu kosu.  
Ana.<sub>POSS</sub> mother is brushed her hair  
'Ana's mother has brushed her hair.'
- TI 6) Kekecov brat je doveo njegovu devojkju.  
Kekec.<sub>POSS</sub> brother is brought his girlfriend  
'Kekec's brothe has brought his girlfriend.'
- TI 7) Stric Konstantina de Sistija je operisao njegovo slepo crevo.  
uncle Konstantin.<sub>GEN</sub> de Sisti.<sub>GEN</sub> is operated his appendix  
'Konstantin de Sisti's uncle has operated his appendix / had his appendix operated.'

<sup>6</sup>The non-standard variant *Milicin* instead of the standard *Miličin* was used in order to attain the authenticity of the everyday, ordinary, informal style of speech.

- TI 8) Unuka Angeline Savić je skratila njene šiške.  
granddaughter Angelina.<sub>GEN</sub> Savić is shortened her bangs  
'Angelina Savić's granddaughter has shortened her bangs.'

## 2. Locality condition

### 2.1 Null possessor

- TI 9) Ujka Toma je rekao da je Bata izneverio *pro* ćerku.  
uncle Toma is said that is Bata betrayed *pro* daughter  
'Uncle Toma said that Bata betrayed his daughter.'
- TI 10) Ketu je tvrdila da je Cakana poljubila *pro* brata u obraz.  
Keti is claimed that is Cakana kissed *pro* brother in cheek  
'Keti claimed that Caka had kisses her brother on the cheek.'

### 2.2 Overt pronominal possessor

- TI 11) Bata je rekao da je Drakče ogrebao njegov obraz.  
Bata is said that is Drakce scratched his cheek  
'Bata said that Drakce had scratched his cheek.'
- TI 12) Ana je tvrdila da je Cakan počupala njenu kosu.  
Ana is claimed that is Cakana pulled at her hair  
'Ana claimed that Cakana had pulled at her hair.'