

## **Chapter 5 Some Syntactico-Semantic Processes in the Serbian Noun Phrase**

### **5.1 INTRODUCTION**

In this chapter, the theoretical assumptions of Chapters 3 and 4 are applied to explain anaphor binding and left-branch extraction. In Section 5.2, it is shown that the semantic distinction between process and result nominals is relevant for anaphor binding. Specifically, only cognitive agents (i.e. actors and experiencers) of process nominals are able to bind reflexives, paralleling the obligatory binding of reflexives by clausal subjects. Specifiers of other nouns are transparent to anaphor binding, producing long-distance binding effects. An argument-structure based binding theory is proposed that accounts for these facts.

With respect to extraction, it is shown in Section 5.3 that whether something can be extracted out of the noun phrase depends on the syntactic category of the extracted element. The generalization is that only elements that are categorially adjectives can be moved out of the noun phrase. An agreement-based analysis is proposed to account for these facts.

## 5.2 ANAPHOR BINDING<sup>1</sup>

One of the most controversial questions in the current literature on anaphor binding is whether a binding theory can be defined in purely syntactic (i.e. configurational) terms or in purely semantic (i.e. theta-theoretic) terms. In this section it will be shown that Serbian binding facts provide good evidence that binding theory should be defined in both terms.

### 5.2.1 Binding Facts

Serbian uses three kinds of pronouns to denote reflexivity: the 'full' reflexive pronoun *sebe*, which has all case forms, except nominative, the clitic reflexive pronoun *se*, which has only the accusative case form, and the possessive reflexive *svoj*. The latter takes on various forms, since it always agrees with the noun it modifies in number, gender, and case. In this dissertation, I discuss the binding properties of the non-clitic reflexive pronouns: *sebe* and *svoj*.

Both *sebe* and *svoj* are generalized to all persons. However, while *sebe* is obligatorily selected when referring to all personal pronouns in the subject position, *svoj* is obligatory only when referring to the 'closest' third person

---

<sup>1</sup>This section is a revised version of my two papers on anaphor binding in Serbian (see Zlati? 1995, 1996). Some of the suggestions/comments received from various people during the First LINGUIST electronic conference are incorporated in this version. I benefited greatly from discussions with Lee Baker, Ileana Comorovski, Daniel Seely, Arnim von Stechow and Stephen Wechsler.

subject.<sup>2</sup> I limit the discussion to the obligatory binding of *svoj*, while referring the reader to Mihaljević's (1990) paper which, among other things, discusses the circumstances under which *svoj* is not bound by first and second person antecedents.

In keeping with Pica's (1987) generalization, the Serbian reflexives *sebe* and *svoj*, being morphologically simple in form, are subject oriented, i.e., they tend to favor clausal subjects as their antecedents (cf. (1-2)).

(1) Jovan<sub>i</sub> se stidi sebe<sub>i</sub>/\*njegaj.

John-N SE shame self/him

'John is ashamed of himself.'

(2) Jovan<sub>i</sub> je dao Marij<sub>j</sub> svoju<sub>i</sub>/\*j /njenuj/njegovu\*<sub>i</sub> knjigu.

John-N AUX gave Mary-D self's/her/his book

'John gave Mary his/her book.'

---

<sup>2</sup>The examples below illustrate this contrast.

i. Jovan<sub>i</sub> je video svoju<sub>i</sub>/njegovu\*<sub>i</sub> sliku u novinama.  
 John AUX saw self's/his picture in newspaper  
 'John saw his picture in the newspaper.'

ii. Ja<sub>i</sub> sam video svoju<sub>i</sub>/moju<sub>i</sub> sliku u novinama.  
 I AUX saw self's/my picture in newspaper  
 'I saw my picture in the newspaper.'

In i., the third person subject *Jovan*, allows only the reflexive possessive *svoju*, whereas in ii., the first person subject *ja*, allows both the reflexive and non-reflexive possessives (cf. *svoju/moju*). This generalization also holds in other Slavic languages (e.g. Russian (Yokoyama & Klenin 1976), Polish (Reinders-Machowska 1991), Czech (Toman 1991)).

In both examples, the nominative subject binds a reflexive pronoun. In these examples, the anaphoric elements and their corresponding antecedents are part of the same predicate, i.e., they belong to the theta-grid of a single verb. The second example illustrates complementary distribution of reflexives and pronouns, reflexives referring to clausal subjects and pronouns referring to objects.<sup>3</sup> This binding pattern, i.e., that reflexives be subject-bound while pronouns be subject-free, is typical of languages with morphologically simple reflexives (e.g., other Slavic languages such as Polish (Reinders-Machowska 1991), Czech (Toman 1991), and Russian (Rappaport 1986), and also non-Slavic languages such as Japanese (Katada 1991), and Norwegian (Hestvik 1991, 1992)).

For binding in clauses, 'subject' means grammatical subject, rather than logical subject, as evident from the passive construction in (3) below.

- (3) Marija<sub>i</sub> je ubijena u svom<sub>i</sub>/njenom\*<sub>i</sub> stanu od strane mafije.  
 Mary-N AUX killed-PASS in self's/her apartment from side mafia  
 'Mary was killed in her apartment by the mafia.'

---

<sup>3</sup>It is worth noting that although Serbian anaphors are subject oriented, it is possible to find some constructions in which the reflexives *sebe* and *svoj* refer to objects. For example, the reflexive pronoun *sebe* can refer to objects when the intensifier *sam* 'alone' is present, which illustrates that it is being used in a non-neutral context. This is shown by the example below, reprinted from Browne (1993 : 367).

- (i) Ja ?u vas<sub>i</sub> prepustiti sebi<sub>i</sub> samim.  
 I will you-CL leave self-D alone-D  
 'I will leave you to yourselves alone.'

Although this construction could be explained with a small clause analysis, i.e., using secondary predication, I will not pursue this idea any further.

As indicated in (3), the possessive reflexive *svom* refers to the nominative subject of a passive verb, while the regular possessive pronoun *njenom* must be disjoint in reference from the subject. Although not indicated, the agent of the passive sentence in (3), expressed by the prepositional phrase (cf. *od strane mafije*) cannot bind the reflexive *svom*. All three examples thus illustrate that the thematic role of a subject is irrelevant for purposes of binding; in (1) the subject is an experiencer, in (2) it is an agent, and in (3) it is a theme.

The subject orientation of Serbian reflexives is also retained in constructions in which the reflexive in question is an adjunct, i.e., is not a part of the same theta grid as its antecedent, as shown in (3) above, and (4) below.

- (4)        Marija<sub>i</sub>        je        videla zmiju    pored    sebe<sub>i</sub>/nje\*<sub>i</sub>.
- Mary-N.F.SG AUX    saw-F.SG        snake    next    self/her
- 'Mary saw the snake next to her.'

In this example, in which the reflexive is embedded in the adjunct prepositional phrase, the reflexive is bound by the subject, the pronoun being excluded in these environments.

Besides nominative subjects, Serbian also allows subjects with quirky cases (dative and accusative) to bind a reflexive. The following examples illustrate this fact.

- (5) a. Mariji<sub>i</sub> je bilo žao sebe<sub>i</sub>/\*nje<sub>i</sub>.  
 Mary-D.F.SG AUX was-NT.SG sorry self/her-G  
 'Mary was sorry for herself.'
- b. Mariju<sub>i</sub> je bilo stid pred svojim<sub>i</sub>/\*njenim<sub>i</sub> drugom.  
 Mary-A AUX was shame front self's/her friend  
 'Mary was shy in front of her (male)friend.'

In the first example, the dative subject *Mariji* selected by the predicate *biti žao* 'be sorry', obligatorily binds the reflexive pronoun *sebe*. In the second example, the accusative subject of the predicative nominal *stid* 'shame/shyness', obligatorily binds the possessive reflexive *svojim* embedded in the adjunct PP.

These quirky subjects arise with psychological predicates, and all have an experiencer role. Subjects with quirky (i.e. inherent) cases do not induce personal subject-verb agreement, as nominative subjects do (cf. *videla* 'saw-F.SG' in (4)). Rather, they trigger a default neuter singular agreement on the predicate (cf. *bilo* 'was-NT.SG' in (5a)), as discussed in Section 3.5.2.2 of Chapter 3. In traditional grammar books (e.g. Stevanović 1991), the subjects with quirky cases are called 'logical' subjects, in order to distinguish them from grammatical nominative subjects which trigger regular subject-verb agreement. However, despite this difference, quirky subjects must still be treated as grammatical subjects in order to distinguish them from dative and accusative objects, which

cannot bind reflexive pronouns (cf. *Mariji* 'Mary-D' in (2) and *Mariju* 'Mary-A' in (6)).

- (6) *Mariju*<sub>i</sub> *ne* *nadjosmo* *u* \**svojoj*<sub>i</sub>/*njenoj*<sub>i</sub> *sobi*.  
Mary-A not found-1.PL in self's/her room  
'We did not find Mary in her room.'

Furthermore, subject QNPs introduced by uninflected quantifiers also count as antecedents (cf. (7)), despite the fact that such subjects have (inherent) genitive case, as argued in Section 3.6 of Chapter 3. Like other subjects with inherent cases, these QNPs also trigger a default neuter singular agreement on the predicate (cf. *napustilo* 'left-NT.SG').

- (7) [*Mnogo izbeglica*]<sub>i</sub> *je* *napustilo* *svoje*<sub>i</sub>/\**njihove*<sub>i</sub> *kuće*.  
many refugees-G AUX-SG left-NT.SG self's/their houses  
'Many refugees left their homes.'

Based solely on the above facts, a 'binder' could be defined in terms of a syntactic notion only, namely, an element that has the grammatical function of a SUBJ(ect). However, when we consider the binding possibilities within the Serbian noun phrase, we find that the above generalization cannot be maintained. This is because the binding relations within the noun phrase are sensitive to thematic relations. Specifically, as illustrated in examples (57) and (58) of

Chapter 4, repeated below as (8) and (10), the binder must be the cognitive agent (an actor or experiencer) irrespective of how it is syntactically realized.

(8) a. [NP Vraćanje izbeglica<sub>i</sub> svojim<sub>i</sub> kućama] se odvijalo sporo.  
returning refugees-G self's-D houses-D SE went slow  
'The refugees' returning to their homes was slow.'

b. Mi<sub>k</sub> smo se svi iznenadili 'we were all surprised'  
[NP Jovanovim<sub>i</sub> vraćanjem dece<sub>j</sub> svojim<sub>i</sub>/\*j/\*k roditeljima].  
John's-ADJ returning children-G self's-D parents-D  
'We were all surprised by John's returning the children to his parents.'

(9) Jovanov<sub>i</sub> strah od svojih<sub>i</sub>/\*njegovih<sub>i</sub> profesora je besmislen.  
John's fear from self's/his professors is senseless  
'John's fear of his professors is illogical.'

(10) Ministar policije je naredio 'The minister of police ordered'  
hapšenje demonstranata<sub>i</sub> zbog \*svog<sub>i</sub>/njihovog<sub>i</sub> agresivnog ponašanja.  
arresting demonstrators because self's/their aggressive behavior  
'the arresting of demonstrators for their aggressive behavior'



The examples in (8a-b) illustrate that only the agent can bind a reflexive within the NP. In (8a), the agent is expressed by the genitive complement, *izbeglica* 'refugees'; in (8b), it is a SPR (i.e. the possessive adjective *Jovanovim* 'John's'). Example (9) illustrates that an experiencer can be an antecedent for a reflexive. Example (10) shows that when the agent is not syntactically realized, the theme argument cannot be a binder. Although it would be pragmatically deviant, the possessive reflexive *svoj*, could in principle, refer to the clausal subject *ministar policije* in (10). In general, when the 'subject' of the noun phrase is not syntactically realized, the subject of the clause counts as an antecedent (cf. (11)).

(11) Jovan<sub>i</sub> je slušao [NP opisivanje sebe<sub>i</sub>/njega\*<sub>i</sub>].

John AUX listened description self/him-G

'John was listening to the description of himself.'

Note that the 'implicit' subject of the noun *opisivanje* in (11) is not necessarily identical to the clausal subject *Jovan*. Thus, only overt 'subjects' of noun phrases form an opaque binding domain, as confirmed by the example (8b). In this example the matrix subject, *mi* 'we' cannot bind the possessive reflexive *svoj* because of the intervening 'specified' subject *Jovanovim*. The following two examples further support this observation.

(12) Jovan<sub>i</sub> je primetio [lošu brigu ovih žena<sub>j</sub> o sebi\*<sub>i</sub>/j/njemu<sub>i</sub>/njima\*<sub>j</sub>].

John AUX noticed bad caring these women-G about self/him/them

'John noticed these women's poor caring for themselves/him.'

(13) Demokrati<sub>i</sub> su se iznenadili 'Democrats were surprised'

[predsednikovim<sub>j</sub> poništavanjem glasova radi svoje\*<sub>i/j</sub> ponovne pobede].

president's -ADJ annulment votes for self's again victory

'The democrats were surprised by the president's annulment of votes for the sake of his renewed victory'.

In both examples, the reflexives are embedded in bracketed noun phrases which have syntactically expressed subjects. In (12), the subject is expressed by the postnominal genitive complement (cf. *ovih žena* 'these women-G'), and in (13), it is realized as a SPR (cf. the possessive adjective *predsednikovim* 'the president's-ADJ'). The reflexives *sebi* and *svojim* must be bound by these subjects rather than by the clausal subjects, showing that the noun phrase forms a minimal binding domain. This is supported by the fact that the corresponding pronouns cannot be bound in this 'local' domain, but only outside the noun phrase, by the clausal subject. Thus, the complementary distribution between reflexives and pronouns is still retained in these environments.

However, not all 'subjects' of nominals form an opaque domain for binding. Specifically, subjects of non-process nominals are transparent to anaphor binding, as the following examples illustrate.

(14) a. Jovan<sub>i</sub> je pročitao/izgubio [Marijin<sub>j</sub> članak o sebi<sub>i/o</sub>].

John<sub>AUX</sub> read/lost Mary's-ADJ article about self

'John read/lost Mary's article about herself/him.'

b. Jovan<sub>i</sub> je pročitao [Marijin<sub>j</sub> članak o njemu<sub>?\*i</sub>/njoj<sub>?j</sub>].

John<sub>AUX</sub> read Mary's-ADJ article about him/her

'John read Mary's article about him/herself.'

The first example illustrates that the binding domain is extended to the entire clause. More precisely, the clausal subject (cf. *Jovan*) can serve as an antecedent for the reflexive even in the presence of the intervening possessor of a non-process nominal (cf. *Marijin*), indicating that these possessors count as a 'non-subject' for the purpose of the subject orientation of the reflexive.<sup>4</sup> We also note that the local binding of a reflexive by the 'subject' of the non-process nominal is dispreferred, hence the '%' status on index *j*. More precisely, while all my 11 informants readily accepted 'long' distance binding, only 3 also accepted local binding, with the comment that the long distance binding is their preferred choice.<sup>5</sup> What is interesting is that all my informants reject binding of a reflexive

---

<sup>4</sup>Rappaport (1986 : 106) also reports that the Russian "NP specifier is transparent to reflexive binding" where the NP specifier means both prenominal and postnominal specifiers. However, Rappaport provides examples only with specifiers of result nominals. Similarly, Reinders-Machowska (1991) and Toman (1991) show that Polish and Czech NP-specifiers can be transparent for anaphor binding. Toman (1991) tries to account for the transparency of subjects of NPs in Czech by saying that this is due to the adjectival nature (i.e. possessive adjectives) of such subjects. Although the same is true in Serbian (the prenominal subjects of NPs are possessive adjectives), subjects of process nominals are still an opacity factor for binding.

<sup>5</sup>Similar judgments are also reported in Bennett (1991).

by a subject of the non-process nominal when this nominal occupies the subject position (cf. (15)).

- (15) [Čomskijeva<sub>i</sub> knjiga o \*sebi<sub>i</sub>/njemu<sub>i</sub>] jepostala bestseler.  
Chomsky's-ADJ book about self/him AUX became bestseller  
'Chomsky's book about himself became a bestseller.'

As indicated in (14b) and (15), regular pronouns can be bound by a local subject, i.e. the subject of the non-process nominals.<sup>6</sup> We can also observe from (14a-b) that the complementary distribution between pronouns and reflexives breaks down for some speakers. Although not shown, the same binding facts obtain for the possessive reflexive *svoj*. The main question that arises is what makes non-process nominals transparent for anaphor binding. In answering this question, I resort to semantic differences between the two types of nouns claiming that only subjects of process nominals have an argument status. This is discussed in the next section.

### 5.2.2 Formulating a Binding Theory

---

<sup>6</sup>With reference to examples like (15), some of my informants remark that they would prefer using the intensifier *sam* 'alone' with the personal pronoun, when the personal pronoun is intended to refer to the subject of the non-process nominal (as in *?omskijeva<sub>i</sub> knjiga o njemu<sub>i</sub> samom* 'Chomsky's book about him alone').

I assume, following Pollard & Sag (1992, 1994) that binding relations are defined on argument structure. However, unlike Pollard & Sag, I don't assume that reflexivization applies only to coarguments, as the above Serbian facts have shown. Before formulating a binding theory that would account for the above Serbian facts, I briefly summarize Pollard & Sag's binding theory, pointing out some problematic examples that their theory is unable to accommodate. I also point out that other theories of binding cannot fully account for the Serbian binding facts presented above.

#### ***5.2.2.1 Inadequacy of Existing Binding Theories***

According to Pollard & Sag (1992, 1994), binding relations involve structure sharing of referential indices (i.e. person, number and gender features) of two coarguments. Their theory makes no reference to configurational notions such as c- or m-command, as assumed in Government & Binding theory, but rather, refers to an obliqueness-command or o-command, for short, which is based on the relative obliqueness of grammatical relations. Pollard & Sag (1992 : 266) assume the following hierarchy of grammatical relations.

(16) SUBJECT < PRIMARY OBJ < SECOND OBJ < OTHER COMPLEMENTS

The leftmost element on this hierarchy is the least oblique and the rightmost element is the most oblique. Binding principles, which account for the

distribution of nominal objects (pronouns, anaphors and nonpronouns, also known as R-expressions), are stated in terms of the above hierarchy. They are given below (from Pollard & Sag 1994 : 254).

(17) HPSG Binding Theory

Principle A. A locally o-commanded anaphor must be locally o-bound.

Principle B. A personal pronoun must be locally o-free.

Principle C. A nonpronoun must be o-free.

where the notions of *o-binding* and *local o-binding* are defined as follows (from Pollard & Sag 1994 : 253-254).

(18) Y (*locally*) *o-binds* Z just in case Y and Z are coindexed and Y (locally) o-commands Z. If Z is not (locally) o-bound, then it is said to be (*locally*) *o-free*.

The notions *o-command* and *local o-command* are defined as follows.

(19) Let Y and Z be *synsem*<sup>7</sup> objects with distinct LOCAL values, Y referential. Then

a. Y *locally o-commands* Z just in case Y is less oblique than Z.

---

<sup>7</sup>Recall from Chapter 3 that the term *synsem* stands for the SYNSEM attribute where syntactic and semantic information of a linguistic object is encoded.

- b. Y *o-commands* Z just in case Y locally o-commands X dominating Z.

Note that the local o-command relation, applying to Principles A & B, is defined nonconfigurationally, i.e., in terms of obliqueness on the ARG-S list (see below). On the other hand, the o-command relation, which applies to Principle C, makes reference to dominance, and hence, to a syntactic configuration.

This theory correctly rules out the following English sentences.

- (20) a. \*John<sub>i</sub> likes him<sub>j</sub>.  
 b. \*John<sub>i</sub> knows Bill<sub>j</sub> likes himself<sub>i</sub>.  
 c. \*Mary<sub>i</sub> described himself<sub>j</sub> to Bill<sub>j</sub>.

The first sentence is ruled out as a violation of Principle B, since *him* is locally o-bound by the subject *John*. In other words, *him* belongs to the same subcategorization frame as the subject, i.e. they are coarguments, formally represented as: \*[ARG-S: <NP:*npro*<sub>i</sub>, NP:*ppro*<sub>i</sub>>], where the indices represent coreference, and *npro* and *ppro* stand for nonpronominal and personal pronoun, respectively. The second example is ruled out by Principle A, for the reflexive *himself* is not locally o-bound, i.e. the argument structure of the verb *like* would have the wrong indexation on its arguments: \*[ARG-S: <NP:*npro*<sub>j</sub>, NP:*ana*<sub>i</sub>>], where *ana* stands for an anaphor. The obliqueness hierarchy in (16) rules out the third example, in which the less oblique anaphor *himself* is bound by the more

oblique argument *Bill* (compare the grammatical sequence *Mary described Bill to himself*).

The obliqueness hierarchy incorporated into binding conditions also correctly accounts for examples like (21).

(21)  $Mary_i$  talked to  $John_j$  about himself<sub>j</sub>.

This is because *to*-NPs are less oblique than *about*-NPs (compare the ungrammatical example \**Mary<sub>i</sub> talked about John<sub>j</sub> to himself<sub>i</sub>*). As Pollard & Sag (1994 : 264) correctly point out, Chomsky's (1986b) configurational binding theory would incorrectly rule this sentence out, because the antecedent *John* does not c-command the anaphor.

In addition, Pollard & Sag's theory correctly accounts for the following English example.

(22) The children<sub>i</sub> like their<sub>i</sub> friends.

The coindexation between the possessive personal pronoun *their* and the subject NP *the children* is allowed, because the possessive is not a co-argument of this subject and hence, it is not locally o-bound. However, this theory cannot account for the corresponding Serbian example, in which the possessive personal pronoun cannot refer to the subject, but rather, the possessive reflexive *svoj* must be used. This is illustrated below.



- (23)      Deca<sub>i</sub>    vole svoje<sub>i</sub>/\*njihove<sub>i</sub> drugove.  
             children like self's/their        friends  
             'The children like their friends.'

This example shows that the notion of local o-command, and hence, coargumenthood, cannot be used in explaining anaphor binding in Serbian. This is especially evident from the examples such as (3-4) in which a reflexive is embedded in an adjunct position (i.e. locative PPs) and must be bound by the clausal subject. Thus, the contrast between (22) and (23) is due to the fact that Serbian reflexives are subject oriented whereas pronouns are anti-subject oriented, as exemplified in (1-4) above. What is needed is to incorporate subject-orientation effects directly into a binding theory, or what Hamilton (1996) has suggested, to formally distinguish between the two types of anaphors, i.e., between SE or monomorphemic anaphors and SELF or polymorphemic anaphors, as is done in transformational theories (e.g. Yang 1983, Pica 1987).

Pollard & Sag's theory is also unable to account for the contrast between binding in process nominals and binding in result nominals (cf. (12-13) vs. (14)). In particular, their theory is unable to account for the long distance binding of reflexives arising with non-process nominals (cf. (14a)). This is because Pollard & Sag (1992) assume, based on the English facts such as (24), that "the possessor functions exactly like a subject for purposes of binding theory" (p. 265).

(24) [NP John's<sub>i</sub> description of himself<sub>i</sub>/\*him<sub>i</sub>] was flawless.

When there is no syntactically expressed possessor of the noun phrase, they assume that anaphors embedded in such noun phrases are exempt from Principle A. This is shown in (25).

(25) John<sub>i</sub> knew that [NP the reports about himself<sub>i</sub>] were fabrications.

In this example, the anaphor *himself* is contained in a noun phrase that lacks a subject. Such an anaphor, lacking an o-commander, is exempt from Principle A. Other non-syntactic factors (e.g. processing, discourse prominence, logophoricity) determine the possible antecedent of the reflexive (for details see Pollard & Sag 1992, 1994).

In (25), the anaphor lacking a referential co-argument and embedded in the subject of the lower clause can be bound by the subject of the matrix clause. However, in Serbian, as well as many other languages, the anaphor is precluded in the above. This is because finite clauses form an absolute binding domain for reflexives, as evidenced by the different binding possibilities in the two Serbian sentences below.

(26) a. Jovan<sub>i</sub> je čuo [S da je [NP priča o \*sebi<sub>i</sub>/njemu<sub>i</sub>] izašla u novinama].

John AUX heard COMP AUX story about self/him appeared in  
newspaper

'John heard that the story about himself appeared in the newspaper.'

b. Jovan<sub>i</sub> je čuo [NP priču o sebi<sub>i</sub>/\*njemu<sub>i</sub>].

John AUX heard story about self/him

'John heard the story about himself.'

In (26a), an anaphor embedded in the subject position cannot take a subject antecedent in a higher clause, indicating that the finite clause is an opacity factor for binding. It is worth mentioning that with this coindexation, the example is literally uninterpretable. A similar observation is made by Rappaport (1986) and Reinders-Machowska (1991), for the identical constructions in Russian and Polish, respectively. However, when the anaphor is embedded in the subjectless NP in object position, as in (26b), it can refer to the clausal subject (cf. *Jovan*).

Note that Chomsky's (1981) definition of 'accessible' SUBJECT, devised to account for the binding pattern in English sentences like (25), would fail to predict the contrary pattern in the corresponding Serbian examples like (26a). This shows that the *i*-within-*i* condition, included in the definition of accessible SUBJECT, cannot be the right explanation for constructions such as (25). This condition disallows an anaphor (or any element) to be coindexed with a

constituent that properly contains it, as in [\*a picture of [itself]<sub>i</sub>]<sub>i</sub>.<sup>8</sup> According to Chomsky, a subject internal anaphor of an embedded clause cannot be coindexed with the AGR(ement) node of that clause, because the violation of the i-within-i condition would arise. Because of this violation, the binding domain should extend to the matrix clause.

Other theories of binding proposed in the literature are also unable to fully account for the Serbian binding facts. For example, Pica's (1987) theory of LF-movement of reflexives, which assumes that monomorphemic reflexives, being X-zero elements, move to INFL(ection) at LF, a position from which reflexives can be c-commanded by a subject, is unable to account for the NP-internal binding of Serbian reflexives.<sup>9</sup> Specifically, his theory is unable to account for binding inside process nominals, since a nominal domain has no INFL node for the reflexive to move to. In addition, this theory would be unable to account for the subject orientation of Serbian reflexives embedded in adjunct positions (cf. (3-4)). This is because the movement of a reflexive out of an adjunct phrase would involve crossing a barrier (adjuncts being non-L(exically) marked), hence, violating the ECP (i.e. antecedent government).

---

<sup>8</sup>Some linguists (e.g., Williams 1982, Higginbotham 1983) view the i-within-i condition not as a syntactic condition but as a semantic condition that has the purpose of disallowing 'referential circularity'.

<sup>9</sup>The claim that monomorphemic reflexives are X-zero elements cannot be retained in Serbian, for the Serbian reflexives *sebe* and *svoj* can be modified:

- i. On mrzi samog sebe.  
He hates alone self  
'He hates himself'.

Similarly, Hestvik's (1992) theory of LF-movement of pronouns, aimed at deriving the anti-subject orientation of pronouns, is unable to account for the binding of regular pronouns by local objects, as in (27).<sup>10</sup>

- (27) Mi smo pričali Petru<sub>i</sub> o njemu<sub>i</sub>/\*sebi<sub>i</sub>.  
 we AUX told Peter-D about him/self  
 'We told Peter about himself.'

According to Hestvik (1992), the anti-subject orientated pronouns are X<sup>0</sup> categories, and as such, move to another X<sup>0</sup> category (i.e. INFL) at LF, a position from which a pronoun is c-commanded by a subject, resulting in a Condition B violation. Hence, the anti-subject orientation of pronouns.<sup>11</sup> However, in (27), the object *Petru* c-commands the pronoun in the minimal binding domain, i.e. a clause, hence, violating Condition B, which according to Hestvik, applies at both levels of syntactic representation: S-structure and LF. For further discussion see Zlatić (1995).

Finally, Progovac's (1992, 1993) relativized SUBJECT theory, which does not involve an LF-movement of reflexives, is also unable to fully

---

<sup>10</sup>In Polish, for example, a sentence corresponding to (27) is also fully acceptable (cf. i. reprinted from Reinders-Machowska 1991 : 138).

- i. Jan<sub>i</sub> opowiada Piotrowi<sub>j</sub> o sobie<sub>i</sub>/\*j/nim\*<sub>i</sub>/j.  
 Jan-N talks Piotr-D about self/him  
 'Jan talks to Peter about himself/him.'

<sup>11</sup>However, as noted in Zlatić (1995), Serbian pronouns, although anti-subject oriented cannot be treated as an X<sup>0</sup> category, simply because they behave like ordinary noun phrases do, allowing restrictive modification. Also, see Section 3.3.2.2 of Chapter 3, for the relevant examples.

account for the above Serbian facts. Following Pica's insight about the correlation between subject orientation or reflexives and their  $X^0$  status, Progovac claims that anaphors must be bound in a domain containing a c-commanding X-bar compatible SUBJECT. According to Progovac, morphologically simple reflexives are subject oriented because they can be bound to AGR, as the only c-commanding  $X^0$  pronominal element. Furthermore, Progovac assumes that an  $X^0$  anaphor has an option of being either an  $X^0$  or an XP category, hence it can be bound by either an  $X^0$  SUBJECT (i.e. AGR) or an XP SUBJECT (i.e. the subject of an NP).<sup>12</sup> What this theory fails to explain is why binding across the subject of the NP is possible outside result nominals (cf. (14a)) but not outside process nominals (cf. (12-13)). In other words, this theory fails to explain why subjects of process nominals are an opacity factor for binding while subjects of result nominals are not. It is exactly this difference that I will try to explain.

In what follows, I propose a binding theory that is able to account for all problematic cases pointed above.

### ***5.2.2.2 An Account***

The Serbian binding facts illustrated in the previous section can be summarized as follows.

---

<sup>12</sup>As pointed out by Lee Baker (personal communication), by allowing an anaphor to have an XP status, nothing prevents it from being bindable by an object.

- (28) a. Within the tensed clause, grammatical subjects bind the reflexives *sebe* and *svoj*. These reflexives can be:
- i. coarguments (cf. (1))
  - ii. adjuncts (cf. (3-4))
  - iii. embedded in an argument of the verb, if that argument lacks a subject (cf. (11) and (26b)), or
  - iv. embedded in an argument of the verb, if that argument has a non-process denotation (with or without a 'subject') (cf. (14a) & (26b)).
- b. Within the noun phrase, only logical subjects (actors and experiencers) bind the reflexives. These reflexives can be:
- i. coarguments (cf. (8) & (12)) or
  - ii. adjuncts (cf. (13))
- c. Pronouns are subject-free either within a tensed clause (cf. (2)) or within a process nominal (cf. (12)).

From the above descriptive generalizations it can be observed that a binding theory cannot be defined in terms of Pollard and Sag's (1992, 1994) notion of local o(bliqueness)-command, simply because the binder and the reflexive do not need to be syntactic coarguments, i.e., they need not be on the same ARG-S, unless we choose to treat adjuncts as arguments. However, I discard this latter option, for reasons to be discussed later in this section. Rather, what is needed is to define binding principles in terms of a more general relation akin to Pollard &

Sag's (1994 : 253) o-command, which plays a role in their Principle C (cf. (17)). I call such a relation an a(argument)-command. My revised definition is given below.

(29) Let  $Y$  and  $Z$  be *synsem* objects with distinct LOCAL values, where  $Y$  referential. Then,  $Y$  a-commands  $Z$  just in case  $Y$  locally a-commands some 'subjectless'  $X$  that dominates  $Z$ .

where the notion of *local a-command* is defined as:

(30)  $Y$  locally a-commands  $Z$  just in case  $Y$  is less oblique co-argument of  $Z$ .

We see that the notion of a-command is defined in terms of both local a-command, i.e. coargumenthood, and dominance, i.e. structural configuration. This is necessary, because the binder can bind everything that is either less oblique hence, locally a-commanded, or is contained in a less oblique argument, hence, the term dominance. Note that a local a-command relation is a subcase of a-command relation in instances when  $X = Z$ , i.e., when  $Y$  and  $Z$  are coarguments.

In the above definition of a-command, we designated that the  $Y$ 's coargument  $X$ , must be subjectless, i.e., it must contain no subject. What counts as a subject? From the descriptive generalizations in (28) we see that a binder of a reflexive can be either a grammatical subject of clauses or a logical subject of



noun phrases (i.e. agents or experiencers). Assuming that binding relations are defined on ARG-S, the binder in the nominal domain can be defined as the first (i.e. leftmost) argument on the ARG-S, hence, the term a(rgument)-subject. In addition, this subject must be the highest on the thematic hierarchy, namely, an agent or experiencer. Oblique agents (i.e. PPs), being absent from the ARG-S, count as no binders (cf. (59) of Chapter 4).

The a-subject in the clausal domain is also defined as the first element on the ARG-S list without imposing any condition of thematic role of that element. It is important to note that *a-subject* does not equal to SUBJ(ect) defined on the VALENCE list (see Chapter 4 for discussion). This is because Serbian is a subject pro-drop language allowing null pronominal subjects (or 'little *pro*' in GB terms). In HPSG terms, this means that little *pro* is present on the ARG-S list, (since it can be a binder) but not on the VALENCE list where only phonetically realized grammatical functions are specified.<sup>13</sup>

In sum, in the nominal domain we find only cognitive-agent oriented anaphors, whereas in the verbal domain, this orientation is grammaticalized, applying to the most prominent syntactic argument.

---

<sup>13</sup>Below is the example of binding in which a phonetically null subject pronoun binds the reflexive *sebe*.

- i. Mrzela        sam sebe.  
   hated-1.SG AUX self  
   'I hated myself.'

Based on these definitions, the distribution of Serbian reflexives and pronouns is governed by the following binding principles.<sup>14</sup>

(31) Principle A: An anaphor must be a-subject-bound.<sup>15</sup>

Principle B: A personal pronoun must be a-subject-free.

where *a-subject* is defined as:

(32) A-subject is the first (i.e. leftmost) argument on ARG-S.

where the terms *a-bound* and *a-free* are defined as:

(33) a. Y a-subject binds Z just in case Y and Z are coindexed and Y a-commands Z.

b. If Z is not a-bound, then it is a-subject free.

The two binding conditions stated above are inverses of each other, indicating that reflexives and pronouns are in complementary distribution. Thus, as far as Serbian binding facts are concerned, the 'disjoint reference' principle

---

<sup>14</sup>In this dissertation, I will not be concerned with R(eferential) expressions, which, according to some linguists (e.g. Reinhart 1983) fall outside the scope of the binding theory.

<sup>15</sup>The Principle A in (31) roughly corresponds to Xue, Pollard & Sag's (1994) Principle Z (independent of their Principle A & B) which accounts for the distribution of the Chinese reflexive *ziji*. A difference is that my notion of a-command defined in (29) of the main text, contains a restriction on the coargument X, i.e. it must contain no subject, whereas in the Xue, Pollard & Sag's definition, there is no such restriction.

(i.e., Principle B) does not need to be stated as a separate principle, but should, as Bouchard (1984) & Burzio (1989) have already proposed, be viewed as an Elsewhere Principle. Based on the facts from Polish, Reinders-Machowska (1991) reaches a similar conclusion.

We further observe that both orientation and locality effects are encoded in the above binding conditions. In this respect, we adopt Vikner's (1985) and Wexler & Manzini's (1987) proposal about the existence of two parameters: antecedent parameter and domain parameter. However, contrary to their view about the independence of these two parameters, I claim that these two parameters are interconnected. This is captured by the notion 'a-subject', which has two functions: (i) to act as a binder and (ii) to define a binding domain.

Furthermore, the binding theory proposed above does not assume reflexivization to occur within a single predicate, i.e., an antecedent and a reflexive do not need to be co-arguments, as assumed, for example, by Pollard & Sag (1992, 1994) and Reinhart & Reuland (1991, 1993). This is especially evident from examples such as (3-4) above, in which a reflexive is embedded in an adjunct position (i.e. locative PPs).

The above principles are able to account for all cases of binding summarized in (28), including case (iv) under (28a), i.e., for constructions in which a reflexive is embedded in an argument of the verb, if that argument has a non-process denotation (with or without a 'subject'). Consider example (14a), repeated below as (34), in which the anaphor is embedded in the non- process nominal that has a 'subject'.

- (34) Jovan<sub>i</sub> je pročitao [Marijin<sub>j</sub> članak o sebi<sub>i/%j</sub>].  
 John<sub>AUX</sub> read Mary's-<sub>ADJ</sub> article about self  
 'John read Mary's article about herself/him.'

In this example, the reflexive *sebi* can be bound non-locally, i.e., outside the noun phrase even in the presence of the intervening 'specified' subject (cf. *Marijin* 'Mary's'). However, I claim that this long distance anaphor binding is only apparent, and that these cases are instances of local binding. Specifically, following Grimshaw (1990), Valois (1991, and Zucchi (1993), I claim that the reason why 'subjects' of non-process nominals are transparent for anaphor binding is because they are not arguments. Since binding relations are defined on argument structure (ARG-S), this means that the specifier of non-process nominals are not a-subjects. Rather, they are adjuncts with no unique thematic role specification. Only subjects of process denoting nominals, having a specific thematic role, and hence the argument status, count as a-subjects. Subjects of other nominals, having no fixed relation to a head noun (cf. 'Possessor' or R-relation of Higginbotham 1985) are not a-subjects, hence, they are transparent to anaphor binding. We saw in (14b) & (15) that the personal pronoun may be locally bound by the 'subject' of non-process nominals, indicating that such subject does not count as a-subject for purposes of anti-subject orientation of pronouns. The fact that some speakers also accept binding of reflexives by subjects of non-process nominals (cf. the index *j* in (34)), indicates that for these

speakers (the minority dialect) the binding theory stated above is subject to variation. One possibility is that for these speakers, subjects of non-process nominals can be either arguments or adjuncts, depending on the specific interpretation of these nominals.<sup>16</sup>

To summarize, 'subjects' of non-process nominals, being absent from the ARG-S list, are invisible for binding, so that the apparent long distance binding (i.e. binding across subjects of non-process nominals) is an instance of local binding. It is for this reason that I reject the option of treating adjuncts as members on the argument structure list. If we treated adjuncts as arguments, we would not be able to account for different behavior of subjects of process nominals from subjects of non-process nominals. In addition, we would not be able to explain why oblique (PP) agents do not count as binders (cf. (59) of Chapter 4). Note that GB-type configurational account would be difficult, since the possessive adjective c-commands the complement of noun regardless of whether it is a result or event nominal. Of course, many GB practitioners have added argument structure based binding on top of the configurational theory, but nothing needs to be added in the case of HPSG.

In several places of this chapter, it was noted that other Slavic languages show a similar behavior with respect to anaphor binding. In particular, as shown by Rappaport (1986) for Russian, Reinders-Machowska (1991) for Polish, and Toman (1991) for Czech, specifiers of nominals are transparent to anaphor

---

<sup>16</sup>Giorgi (1987) also reports that in Italian, subjects of non-process nominals, such as *a book*, *a letter*, can bind reflexives if they are interpreted as having a specific theta role, e.g. the agent of writing. If they are interpreted as a 'possessor', such subjects can't bind a reflexive.

binding. However, these researchers provide examples of binding involving only specifiers of non-process nominals. Based on the observed contrast in binding possibilities involving Serbian process and non-process nominals, it would be interesting to see whether the same contrast is obtained in other Slavic languages as well. In other words, whether binding in NPs in other Slavic languages depends on the nature of the noun's argument structure.

### 5.3 LEFT BRANCH EXTRACTION

It is well known that many languages, including Serbian, do not obey Ross' (1967) Left Branch Constraint (LBC) devised to rule out constructions in which NP-internal left branch constituents are extracted from within the noun phrase. Ross (1967) proposed this condition to disallow English constructions like the following.

- (35) a. \*Whose<sub>i</sub> did you read [NP t<sub>i</sub> book]?  
b. \*Which<sub>i</sub> did you read [NP t<sub>i</sub> book]?  
c. \*What kind<sub>i</sub> did you read [NP t<sub>i</sub> a book]?

However, Serbian as well as many other languages allows extraction of this kind.<sup>17</sup> In this section I offer an HPSG analysis of extraction of left branch constituents out of the Serbian noun phrase. I show that whether something is extractible depends on the syntactic category of the extracted elements. Specifically, I show that only elements that have an adjectival status can be extracted, nominal categories being precluded from extraction. I claim that the reason why only adjectival categories can be extracted is due to the fact that they share CONCORD features with the head of the phrase from which they are

---

<sup>17</sup>Grosu (1974) cites Russian, Turkish, Japanese, French and Rumanian as languages that do not obey Ross's Left Branch Condition.

removed. These features identify a filler with the features of a gap. Nominal categories, being in no agreement relation with the head of the phrase that contains the gap, cannot identify a filler-gap dependency, hence, they cannot be extracted. I first illustrate the relevant facts and then offer an agreement-based analysis of this type of extraction.

### 5.3.1 The Relevant Facts

It was illustrated in Section 3.3 of Chapter 3 that all prenominal adjectival-like elements (determiners, universal quantifiers, ordinary and possessive adjectives) can be extracted out of the Serbian noun phrase, and therefore violate Ross' (1967) Left Branch Condition (LBC). The following two examples reproduced from Chapter 3, illustrate this type of extraction.

- (36) a. Ovu<sub>i</sub>/lepu<sub>j</sub>            sam    pronašla [NP t<sub>i</sub>/t<sub>j</sub> knjigu.]  
           this/nice-A.F.SG    AUX    found                    book-A.F.SG  
           lit. 'This/nice I found book.'
- b. Koju<sub>i</sub>/kakvu<sub>j</sub>                si    pronašla [NP t<sub>i</sub>/t<sub>j</sub> knjigu.]  
           which/what kind-A.F.SG    AUX    found                    book-A.F.SG  
           lit. 'Which/what kind did you find book?'



In both examples, the pronominal elements are extracted from within the object position. The first example illustrates that a demonstrative and/or an attributive adjective can be extracted out of the noun phrase. The second example illustrates that the corresponding interrogative elements (cf. *koju/kakvu* 'which/what kind') can be extracted as well. Note that in both examples the extracted elements have the same agreement features as their modified head noun. It is interesting to note that the above constructions, in which only a leftmost element is fronted is more natural than the constructions in which the head noun is pied piped along with the left branch element. For example, the construction in (36b) represents a regular means for forming a constituent question whereas one in (37) below, in which the entire wh-phrase is fronted, is somewhat marked, receiving a focused stress.

- (37)      *Koju*            *knjigu*            *si*            *pronašla?*  
               which-A.F.SG    book-A.F.SG    AUX        found  
               'Which book did you find?'

Recall from Section 3.3 of Chapter 3 that all adjectival-like elements except referential adjectives are treated as adjuncts. Referential, or what traditional grammarians call possessive adjectives, are treated as having a grammatical function of a SPR (specifier). These adjectives can function as arguments of argument taking nominals, as shown in the section on anaphor binding. The fact that these adjectives can be extracted as well, shows that left-

branch extraction is insensitive to the argument-adjunct dichotomy. The following examples illustrate extraction of a possessive adjective.

(38) a. Jovanovu<sub>j</sub>      sam      pronašla      [NP t<sub>j</sub> knjigu].  
 John's-A.F.SG      AUX-CL      found      book-A.F.SG  
 lit. 'John's I found book.'

b. Čiju<sub>j</sub>      si      pronašla [NP t<sub>j</sub> knjigu].  
 whose-A.F.SG      AUX-CL      found      book-A.F.SG  
 lit. 'Whose did you find book?'

(39) a. Jovanovo<sub>j</sub>      mi se      svidja      [NP t<sub>j</sub> ocenjivanje].  
 John's-N.NT.SG      I-D.CL SE-CL      like      grading-N.NT.SG  
 lit. 'John's I like grading.'

b. Čije<sub>j</sub>      ti      se      svidja [NP t<sub>j</sub> ocenjivanje]?  
 whose-N.NT.SG      you-D.CL SE-CL      like      grading-N.NT.SG  
 lit. 'Whose do you like grading?'

In (38), the non-argument possessive adjective and its corresponding interrogative counterpart are extracted from the object position. In (39), the argument adjective and its corresponding interrogative element can be extracted from the same position.

Extraction out of an NP in the subject position is hard to test due to the fact that clitics must appear in the second position in the clause, meaning after the first accented word (cf. Zec & Inkelas 1993) or after the first phrase. In (38) and (39), clitics appear after the first word. The following examples illustrate the placement of clitics relative to the subject NP.

- (40) a. [NP Ovaj student] mi je dao knjigu.  
 this-N.M.SG student-N.M.SG I-D.CL AUX-CL gave book  
 'This student gave me the book.'
- b. Ovaj mi je student dao knjigu.  
 this-N.M.SG I-D.CL AUX-CL student-N.M.SG gave book
- c. Koji ti je student dao knjigu?  
 which-N.M.SG you-D.CL AUX-CL student-N.M.SG gave book  
 'Which student gave you the book?'

In the first example, the pronominal dative clitic *mi* and the auxiliary clitic *je* occur after the first constituent, i.e. after the subject NP, *ovaj student*. In the second and third example, the same clitics are placed after the first word, which is part of the subject NP. Based solely on these three examples, we have no evidence that left-branch elements are actually removed from within the subject noun phrase. Halpern (1995 : 83 -84) provides such evidence, showing that at

least in wh-questions, the wh-left-branch element is extracted out of the subject noun phrase. This evidence pertains to the placement of the demonstrative *to* 'it/that' and its variants *ovo* 'this', *ono* 'that-distal', in clefting constructions. These constructions consist of the demonstrative *to* followed by a finite clause, as exemplified below (from Halpern 1995 : 83).

- (41) a. *To Marija svira klavir.*  
it Mary plays piano  
'That's Mary playing the piano.'
- b. \**Marija to svira klavir.*

The ungrammatical example in (41b) shows that the demonstrative *to* must be the leftmost element. When clitics occur, they must follow the demonstrative *to* (cf. (42) from Halpern 1995 : 83).

- (42) a. *To je ova devojka svirala klavir.*  
it AUX-CL this girl played piano  
'That was the girl playing the piano.'
- b. \**Ova je to devojka svirala klavir.*
- c. \**Ova devojka je to svirala klavir.*

From the ungrammatical examples in (42b-c), we can see that *to* cannot penetrate inside the finite clause, i.e. it must still be the leftmost element with the clitics following it. However, with interrogative elements, the demonstrative *to* can appear either after the entire wh-phrase (as in (43a)) or after the first wh-word (as in (43b)). (Both examples are from Halpern 1995 : 84).

(43) a. Čija prijateljica je to svirala klavir?  
 Whose friend AUX-CL it played piano  
 'Whose friend was that playing the piano?

b. Čija je to prijateljica svirala klavir?  
 whose AUX-CL it friend played piano

Based on these examples, we can conclude that left branch wh-extraction out of subject NPs is possible. The question as to why left-branch elements in declarative clauses do not behave the same way remains open.<sup>18</sup>

Besides interrogative adjectival elements, the corresponding relative pronouns can also be separated from the head they modify (cf. (44b)).<sup>19</sup>

---

<sup>18</sup>A similar NP/wh asymmetry arises in English with respect to preposition stranding. Specifically, preposition stranding in wh-questions is easier (cf. i.) than in NP-preposing (cf. ii.). (Both the examples are reproduced from Lehrer 1986 : 143).

- i. What is it a book about?
- ii. ?Dogs we have a book about.

<sup>19</sup>Grosu (1974) shows that in Russian only wh-words can be extracted from the left branch but not relative pronouns, so that the Russian sentence corresponding to (44b) is ungrammatical.

- (44) a. Ovo je žena čiju kuću sam ti pokazala.  
 this is woman whose-A.F.SG house-A.F.SG AUX you-D show  
 'This is the woman whose house I showed you.'
- b. Ovo je žena [čiju; sam ti pokazala [ t; kuću]].  
 this is woman whose-A.F.SG AUX you-D show house-A.F.SG

That left branch extraction is possible because the left branch elements are categorially adjectives can be supported by the fact that nominal categories, be it arguments or adjuncts, cannot be extracted from within the noun phrase. As shown in the previous chapter, in the neutral order all NPs follow the head noun (cf. the genitive NP complement *ovog studenta* in (45a)). In marked context (e.g. emphasis) these NPs can also occur in a prenominal position (cf. *ovog studenta* in (45b)).

- (45) a. Pronašla sam [NP knjigu [NP ovog studenta]].  
 found-1 AUX book-A.F.SG this-G.M.SG student-G.M.SG  
 'I found the book of this student.'
- b. Pronašla sam [NP ovog studenta [NP knjigu]].  
 found-1 AUX this-G.M.SG student-G.M.SG book-A.F.SG

However, irrespective of their position, these NPs cannot be removed out of the dominating noun phrase. This is shown below.

- (46) a. \*Ovog studenta<sub>j</sub> sam pronašla [NP knjigu [NP t<sub>j</sub>]]?  
 this-G.M.SG student-G.M.SG AUX found book-A.F.SG  
 '\*Of this student, I found the book.'
- b. \*Koga<sub>j</sub> si pronašla [NP knjigu [NP t<sub>j</sub>]]?  
 who-G AUX found book-A  
 '\*Of whom did you find the book?'

These examples illustrate that neither NP- nor wh-extraction is possible from NP complements of nouns. Furthermore, extraction of left branch elements from within NP-complements of nouns is also precluded:

- (47) a. Pronašla sam [NP knjigu [NP ovog studenta]].  
 found-1 AUX book-A.F.SG this-G.M.SG student-G.M.SG  
 'I found the book of this student.'
- b. \*Kojeg<sub>j</sub> si pronašla [NP knjigu [NP t<sub>j</sub> studenta]]?  
 which-G.M.SG AUX found book-A student-G.M.SG  
 '\*Of which did you find the book student?'



In this ungrammatical example, the *wh*-word *kojeg* 'which-G' corresponding to the demonstrative *ovog* 'this-G' of a declarative sentence in (47a), cannot be moved out of the postnominal NP complement. This shows that NP-complements of nouns form an opaque domain for left-branch extraction. However, it is not the case that NPs cannot be moved within the clause. The following example illustrates that the object NP can be fronted.

- (48) [Knjigu ovog studenta] sam već pronašla.  
 book-A this-G student-G AUX already found  
 'I already found the book of this student.'

Left branch extraction is strictly a local process, confined to a single clause, as evidenced by the ungrammatical example in (49b) in which the adjectival *wh*-phrase *kakva* 'what kind' is extracted out of the embedded finite clause.

- (49) a. Jovan je čuo [S da je Marija kupila nova kola].  
 John AUX heard that AUX Mary bought new-A.F.SG car-A.F.SG  
 'John heard that Mary bought a new car.'
- b. \*Kakva<sub>j</sub> je Jovan čuo [S da je Marija kupila t<sub>j</sub> kola]?  
 what-kind-A.F.SG AUX John heard that AUX Mary bought car-A.F.SG  
 lit. 'What kind did John hear that Mary bought car?'

The main task here is to explain why adjectival, but not nominal categories can be extracted out of the noun phrase and why left branch extraction from within NP complements of nouns is excluded.

### **5.3.2 An Agreement Approach to Left Branch Extraction**

#### ***5.3.2.1 The Filler-Gap Agreement Principle***

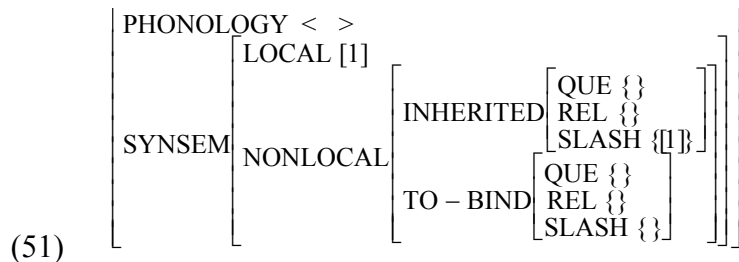
A descriptive generalization that emerges from the Serbian extraction facts is that only agreeing elements can be extracted out of dominating NPs. In particular, the extracted element and the NP containing its gap must have the same agreement features, or what I have called CONCORD features. This explains why NP complements of nouns, showing no agreement with the noun that selects them, cannot be moved out of the containing noun phrase (cf. (46)). Furthermore, left branch extraction from within the NP complement of a noun is also precluded since the extracted elements show agreement with the head of the noun's complement rather than with the head that selects that complement (cf. (47b)). From these generalizations, we can formulate the following filler-gap agreement principle that would account for the distribution of Serbian left-branch gaps.

- (50) A filler must agree in CONCORD features with the verb's dependent that contains the gap.

This principle would correctly rule out examples in which the filler agrees with the complement of the verb's NP argument, as in (47b). In addition, this principle would exclude left branch extraction out of the verb's complement clause (cf. (49b)) simply because clauses have no CONCORD features. Below, I show how this principle can be incorporated into the HPSG theory of filler-gap dependencies.

### 5.3.2.2 Formalizing the Account

In HPSG, extractions are handled through the NONLOCAL feature, which takes other features as its value depending on the type of filler-gap dependency. The feature QUE is used for wh-extraction, REL for relatives and SLASH for other unbounded dependencies, such as topicalization. A filler-gap dependency is introduced by a gap, which in this theory has the status of a special lexical item, shown in (51) (reproduced from Pollard & Sag 1994 : 161).



As can be seen from this lexical entry, a trace has no phonology. However, it has a specification for the INHERITED nonlocal feature. Specifically, a trace has a non-empty SLASH value, indicated by the tag [1].<sup>20</sup> This value corresponds to the value for the LOCAL features of the trace, indicated by same tag [1]. Using the Serbian topicalization example in (38a), repeated below as (52), I show how the filler and the gap are identified.

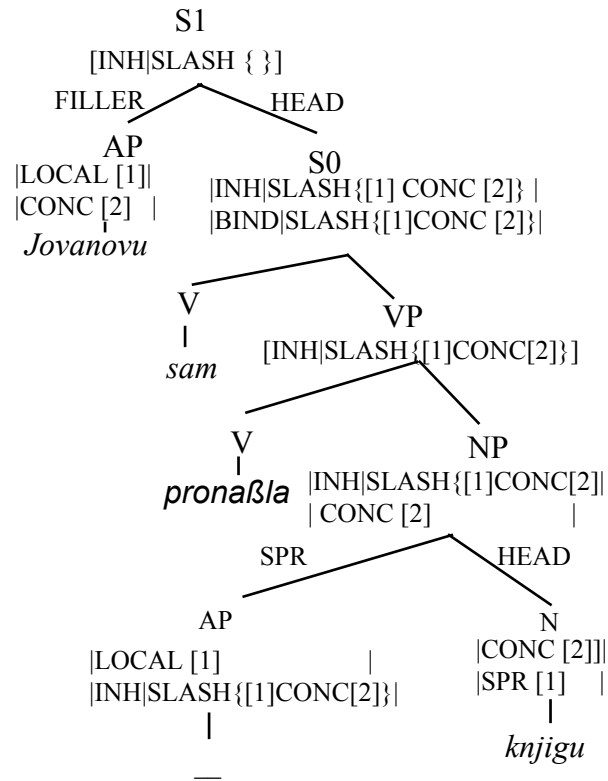
- (52) Jovanovu<sub>j</sub>      sam      pronašla      [NP t<sub>i</sub> knjigu].  
          John's-A.F.SG      AUX-CL      found                      book-A.F.SG  
          lit. 'John's, I found book.'

The phrase marker of this sentence would look as follows.

---

<sup>20</sup>Note that the SLASH feature takes a set as its value. This is necessary in order to allow for multiple unbounded dependencies.

(53)



This unbounded dependency construction contains three parts: bottom, middle and top. The bottom part of the tree introduces the gap, the middle part involves percolation of the gap, i.e., the percolation of the INH|SLASH feature, and the top part introduces the filler, which closes-off the filler-gap dependency.

Starting from the bottom where the gap is introduced, we see that the gap has no phonology (indicated by the underscored line), rather it has a non-empty value for the nonlocal inherited SLASH feature (cf. the tag [1]). This value is identical to the gap's LOCAL feature, which is imposed by the noun *knjigu*. Specifically, the above gap is an AP and functions as a SPR (specifier) of the

noun *knjigu*, indicated in the noun's lexical entry. Furthermore, we note that the missing specifier has the same value for the CONCORD features as the head noun, indicated by the tag [2].

The middle part of this unbounded dependency indicates the percolation of the INH|SLASH feature up the tree. The universal Nonlocal Feature Principle (NLFP) defined below, is responsible for this percolation.

(54) NONLOCAL Feature Principle (Pollard & Sag 1994 : 378)

For each NONLOCAL feature the INHERITED value on the mother is the union of the INHERITED values on the daughters minus TO-BIND value on the head daughter.

This principle unions the daughters' nonlocal inherited SLASH values and then removes them from the set whenever it reaches an element specified for the appropriate TO-BIND|SLASH feature, i.e. on the node where the filler and the gap are identified. In the above phrase marker, the non-empty SLASH value of the specifier daughter is inherited by the mother's NP node, indicated by the identical tag [1]. Note that this NP with a non-empty SLASH specification must agree with the CONCORD of that SLASH (cf. the tag [2]). This is guaranteed by the Head Feature Principle which insures that the information on the head percolates up to all projections of that head. The NP's sister node (i.e. the verb

*pronašla* 'found') has an empty SLASH list (not shown).<sup>21</sup> Hence, their mother, i.e. the VP node, inherits their SLASH values, resulting in a single SLASH element with a tag [1]. By the NLFP, the SLASH value is passed all the way up the tree until the S1 node. This node's head daughter contains the specification for both the INHERITED SLASH value with the tag [1] and the same value for the TO-BIND SLASH feature. It is at this node that the inherited SLASH feature is 'bound-off' or discharged. This binding or 'identification' between filler and gap is guaranteed by the Head-Filler Schema, given below.

(55) Head-Filler Schema

$$X \rightarrow [\text{LOCAL } [1], \text{S}[\textit{fin}, \left. \begin{array}{l} \text{INHERENT|SLASH } \langle [1] \rangle \\ \text{TO - BIND|SLASH } \langle [1] \rangle \end{array} \right] ]$$

FILLER                      HEAD

This schema says that the filler's LOCAL value is identical to the item in the INHERENT|SLASH value of the head daughter, indicated by the identical tags on both the filler and the head.

Note that in the phrase marker in (52), the top node, S1 has an empty SLASH list, which is the result of NLFP, i.e. appending the filler's (i.e. AP *Jovanovu*) empty SLASH value (not shown) with the non-empty SLASH value of its head daughter minus the TO-BIND value on the head-daughter.

---

<sup>21</sup> It should be noted that auxiliaries (like the auxiliary clitic *sam*) are treated on a par with raising verbs, i.e. verbs which do not assign a semantic role to their subjects. Specifically, the subject of an auxiliary has the entire SYNSEM value structure-shared with that of the subject of its 'unsaturated' VP complement.

In sum, the distribution of left-branch gaps is governed by the Agreement principle in (50), which can be viewed as a trace principle, analogous to the Empty Category Principle of Government and Binding Theory. The identification of a filler with that of a gap is achieved locally, via NLFP. In other words, in HPSG filler-gap dependencies are decomposed into local dependencies. Thus, a non-null SLASH value is found on every node dominating the trace, up to the point where it is unified with the filler. In contrast, wh-movement in Government and Binding (GB) theory is assumed to land only at certain intermediate nodes such as Spec, CP. To put it differently, in a non-transformational phrase structure grammar, a constituent dominating a gap is treated as an 'abstract', with different features from a constituent without a gap. This leads to different expectations about where one should find morphology which flags extraction domains (as in Austronesian languages, described below), or morphology which is a prerequisite for extraction (as in Serbian). In GB, it is expected on C, while in HPSG, it could be at any category. For example, in Austronesian languages, the morphology that flags extraction domains is found on V(erb), and there are languages that use prosodic means to mark an extraction domain (see Hukari & Levine 1995 for examples).

I have shown that in Serbian there is a requirement of agreement between the NP and the trace, i.e., only elements agreeing with it can be extracted from it. In HPSG this reduces to a simple local condition on phrases, since the NP bearing the agreement morphology has a feature specifying that it is an 'abstract' (has a gap), and even specifies the agreement features of that extracted item. There is



nothing corresponding to this in GB, unless one assumes that the extracted item stops in some local NP-internal position on its way.

In conclusion, it is worth pointing that it is not unusual cross-linguistically to employ agreement strategies in filler-gap dependencies. For example, in Chamorro and Palauan, in relativization and constituent questions, the verb gets special markings depending on the grammatical function of the gap, including the special marking for adjunct extraction. To account for this fact, Chung & Georgopoulos (1988 : 260) propose the following WH-agreement rule.

(56) *WH-Agreement*: A verb agrees in grammatical function with the constituent that is dependent on it and contains a gap.

For example, in Chamorro, a VSO language, if a subject is extracted, then the verb gets the infix *-um-* (cf. (57a)) instead of the regular agreement prefix *ha-* of a declarative sentence (cf. (57b)).

(57) a. Hayi fuma'gasi i kareta?  
who AGR(WH.SBJ).wash the car  
'Who washed the car?'

- b. *Ha-fa'gasi*                      *si*    Henry *i kareta* *ni häpbun*.  
 AGR(3.SG.RT).wash    UNM   Henry the car   with soap  
 'Henry washed the car with soap.'

The domain for this wh-agreement marking can be a single clause or clauses "that dominate the gap, and do not dominate its antecedent, in constituent structure" (Chung & Georgopoulos 1988 : 255). In case of long distance dependencies, i.e. when the filler and the gap are separated by several clauses all verbs show wh-agreement. The verb whose argument is missing is marked for the appropriate wh-agreement, depending on the grammatical function of that gap. Higher verbs in a dependency chain agree "in grammatical function with whichever one of their clausal arguments contains the gap" (Chung & Georgopoulos 1988 : 258). In this sense, the wh-agreement marking is strictly a local process. The following Chamorro example (from Chung & Georgopoulos 1988 : 259) illustrates this.

- (58) *Hafa sinangane-nna*                      *i chi'lu-mu*                      [*malago'-na* \_\_\_ ]?  
 what    AGR(WH.OBJ).tell-3.SG    the sister-your    AGR(WH.OBL).want-3.SG  
 'What did your sister tell (you) she wants?'

In this example, the matrix verb *sangani* 'tell' agrees with its clausal second object that contains the gap, while the embedded verb agrees with its missing oblique

argument. This local path of unbounded dependency markings provides the overt evidence for the existence of the Nonlocal Feature Principle.

One difference between Serbian and these two languages is that in Chamorro and Palauan, the agreement is marked only on the head that contains the gap (i.e. the verb), whereas in Serbian, both the filler and the head that contains the gap must have the identical agreement features. Furthermore, in Serbian this agreement is not specialized just for extraction, but also occurs in regular, ungapped constructions, as seen in Section 3.3 of Chapter 3. Finally, while in Chamorro & Palauan the domain of the filler-gap dependency can be extended to embedded clauses, in Serbian it is confined to a single clause.