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THE ACQUISITION OF LONG-DISTANCE BINDING IN SERBO-CROATIAN

M.A. Thesis

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February 1994

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*Dedicated to all the children in the former Yugoslavia.*

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Danijela Kudra

## ABSTRACT

This study tested children's sensitivity to Wh-movement and Long Distance Binding in question formation. Serbo-Croatian offers two almost parallel strategies for making questions: Wh-movement, which is sensitive to islands, and Za+Wh strategy, which requires Long-Distance Binding, irrespective of the presence of islands. The analysis proposed by Progovac (1992) treats Za+Wh structures as a non-movement operation, presumably an instance of a language-specific application of Principle B of the Binding Theory. The possibility of creating minimal pairs of movement/non-movement questions has enabled us to test children's knowledge of both the Bounding and the Binding Theory.

This study reports the results of two experiments, in which 42 child subjects (aged 4 to 6) and a control group of 8 adults, were tested. The children performed badly on Long-Distance Binding structures, showing an overall preference for top clause responses, and a higher number of "other" responses in Za+Wh questions. The children's performance on the Principle B experiment showed that Binding Theory is acquired by the age of four. This has ruled out the lack of knowledge of the Binding Theory as a source of errors with Za+Wh structures. Other possible causes for the children's insensitivity to the distinctions between Wh-movement and Long-Distance Binding are analyzed, and a follow-up study, with more "relaxed" conditions, is currently carried out.

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## Introduction

This study addresses the problem of the acquisition of question formation in Serbo-Croatian. It is generally assumed that questions in most languages are formed by Wh-movement. Serbo-Croatian is one of the languages that has another, non-movement option, for question formation, and is thus of special interest for language acquisition studies.

Chapter one addresses some general issues related to Wh-movement, as analyzed in the Government and Binding framework, as well as language variation in question formation.

Chapter two represents an analysis of the constraints on Wh-movement in Serbo-Croatian. A detailed account of a non-movement operation, for which Principle B (of the Binding Theory) analysis is adopted, comprises the second part of this chapter.

General questions regarding the acquisition of movement rules and related language acquisition studies are addressed in the third chapter. The next chapter describes in detail the experiments carried out and provides a statistical analysis of the data.

The last chapter addresses the problem of the lack of knowledge of long-distance binding in child grammar. It also poses a number of questions, related to both syntactic theory and language acquisition, which may be addressed in future research.

## Chapter One

### 1.1. The Grammar of Wh-movement

As proposed by Chomsky (1977,1982,1986b), questions, relative clauses and some other sentence types in English and many other languages are formed by the syntactic movement of a Wh-phrase into the Complementizer phrase position. In some other languages, e.g. Mandarin Chinese, Wh-words remain in-situ at S-Structure, and move at LF to ensure their interpretation. Languages vary with respect to the level at which Wh-movement applies and LF is the level at which all the Wh-words have to move. Syntactic movement (movement at S-Structure) was observed (Chomsky:1963; Ross:1967) to be subject to a number of constraints (the Complex NP Constraint, the Wh-Island Constraint, the Subject Island Constraint, and the Temporal Island Constraint). Violation of any of the islands above would result in an ungrammatical structure, as shown in examples 1 and 2 below (in which the Subject Constraint and Temporal Island Constraint are violated).

1.\*What<sub>i</sub> did a book about t<sub>i</sub> make Mary cry?

2.\*What<sub>i</sub> did Mary eat an apple before washing t<sub>i</sub>?

These constraints on movement were later unified under the Subjacency condition. As formulated by Chomsky(1973), Subjacency is a structurally based principle, which

constrains a phrase structure representation of S-Structure, as well as the application of the corresponding movement rules.<sup>1</sup> S-Structure is the level at which the Subjacency condition is used to check for the grammaticality of structures formed by Wh-movement. Under this condition, ungrammatical constructions result from crossing more than one layer of structure, i.e. a bounding node. It was assumed that bounding nodes were subject to parametric variation (i.e. NP and IP are bounding nodes in English, whereas NP and CP are bounding nodes in Italian).<sup>2</sup> Consider the example below, in which two bounding nodes are crossed and a Subjacency violation results.

3.\*[<sub>CP</sub>Who did [<sub>IP</sub>he make [<sub>NP</sub>the claim [<sub>CP</sub>t' that [<sub>IP</sub>he saw t]]]]

It is generally agreed that obedience to island constraints, subsumed under the Subjacency condition, is diagnostic of whether the movement operation has applied or not, at S-Structure.

Another property of Wh-movement is that it forms a chain between the moved Wh-phrase and its trace through which the case is transmitted. While intermediate traces are created to observe Subjacency at S-Structure, the Empty Category Principle requires proper government of all traces. Proper government is defined in terms of theta-government or antecedent-government. Subjacency, the condition on movement, and the ECP, the condition on government, check for the grammaticality of structures formed by Wh-movement.

## 1.2. The Barriers Analysis

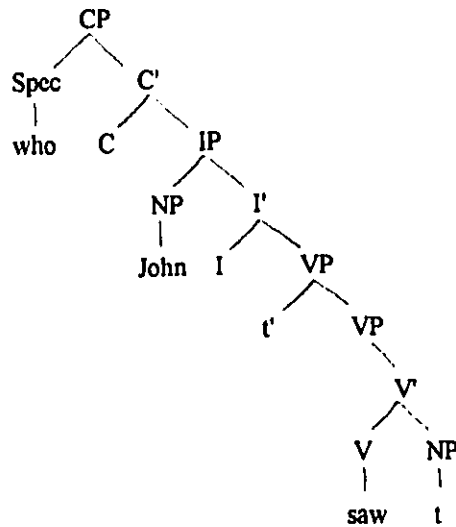
The Barriers framework offers a new analysis of the Subjacency condition. The degree of grammaticality of the structures formed by movement is based on the number of barriers crossed. Barriers are not set for each language independently, but will be defined for every structure by the theory of blocking categories. Position in a tree and marking by a lexical head determine blocking properties of a certain category. Maximal projections are barriers either intrinsically, or they inherit barrierhood when immediately dominating another blocking category which is itself an intrinsic barrier. Consider the example below:

4.a. I wonder who John saw.

with the D-structure of the embedded question:

4.b. [CP e [IP John [VP saw who]]]

Wh-movement would have to cross VP (a barrier, since it is not lexically marked) and IP (which would inherit barrierhood from the category that it immediately dominates, i.e. VP). This would result in a Subjacency violation and derive an ungrammatical structure. Given that embedded questions of this type are grammatical, another option is considered as a way to circumvent Subjacency. Chomsky (1986b) proposes that Wh-phrases move in a succession of cyclic steps first to a VP-adjoined position, and then to the SpecCP position. Consider the tree representation of the revised structure:



2.c. [CP who<sub>i</sub> [IP John [VP t' [VP saw t<sub>i</sub>]]]

Movement to an adjoined position does not involve crossing any barriers. IP, on the other hand, is not a barrier since it is defective and has no category to inherit barrierhood from. VP adjunction enables us to apply movement operations without violating one of the fundamental conditions on movement, i.e. Subjacency.<sup>3</sup>

The number of barriers crossed corresponds to the degree of Subjacency violation created and the degree of the grammaticality of structures derived by movement. The N-Subjacency condition is defined as follows:

B is N-subjacent to A iff there are fewer than n+1 barriers for B that exclude A.

(Barriers:30)

The best possible case is 0-subjacency (no intervening barriers in the movement path); while 2-subjacency creates

ungrammatical structures. Regardless of the varying degree of Subjacency violations, degree-2 Subjacency indicates that a constraint on movement has been violated and is used as a test of knowledge of the Bounding Theory.

Another condition accounting for the grammaticality of Wh-movement, i.e. government of traces, can also be reinterpreted in the Barriers framework. ECP says that traces must be properly governed. The split version of ECP (Chomsky:1986b) defines proper government in terms of either antecedent-government or theta-government. The barriers discussed above can block antecedent-government and cause the ECP violation. Consider the following example:

5. \* $[_{CP} \text{Who}_i \text{ do } [_{IP} \text{you wonder } [_{CP} \text{what}_j \text{ } [_{IP} \text{t}_j \text{ will say } \text{t}_i \text{ } ]]]]$

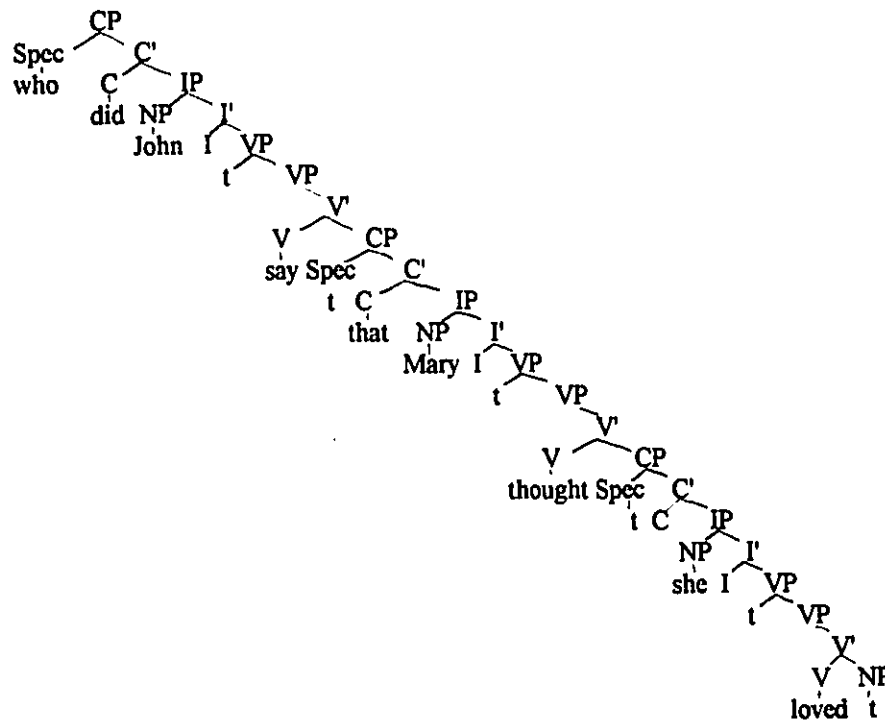
The movement of the Wh-word what causes no violation since its trace is governed by the verb and movement crosses less than two barriers. The wh-word who on the other hand, crosses two barriers, thereby creating a degree-2 Subjacency violation. However, the ungrammaticality of the structure, does not arise from the Subjacency violation only. The trace of who is neither theta-governed (since there is no element to get the theta-role from), nor it is antecedent-governed (because the real antecedent is too far to govern it). The ECP has also been violated.

The unificatory force of the Barriers analysis is that the notion of barriers accounts for both Subjacency and the ECP, the two related principles which play a major role in Wh-movement. The only difference between them is that one barrier blocks government, whereas two barriers block movement.

### 1.3. Long-Distance Wh-movement

Wh-phrases can move long-distance to reach an S-Structure position several clauses higher than their position at D-Structure. Consider the example below.

6. [<sub>CP</sub>who<sub>i</sub> did [<sub>IP</sub>John [<sub>VP</sub>t' [<sub>VP</sub>say [<sub>CP</sub>t' that [<sub>IP</sub>Mary [<sub>VP</sub>t' [<sub>VP</sub>thought [<sub>CP</sub>t' [<sub>IP</sub>she [<sub>VP</sub>t' [<sub>VP</sub>loved t<sub>i</sub>]]]]]]]]]]]]]]]]]]]



The Wh-word who has moved through a succession of CP specifiers leaving a coindexed trace in each of these positions. Being lexically marked by the verb love in the bottom-most clause, the trace is properly governed and the intermediate traces are antecedent-governed. Therefore, the ECP is respected. If, as proposed in Barriers, the Wh-word is first adjoined to VP and subsequently moved into the SpecCP position, the Subjacency condition is respected since no barriers intervene in the movement path. Long-distance Wh-movement is, as shown above, constructed of a series of local Wh-movements.

#### 1.4. Language Variation

It has been observed (see, for example, Engdahl and Ejerhed:1982) that a certain degree of island constraint violations is permitted in some Scandinavian languages. Swedish and Norwegian, for example, allow violations of the Complex NP Constraint and the Wh-island constraint. It has been proposed that not only structurally based principles (like Subjacency), but other factors as well (such as discourse principles, lexical restrictions, etc.) account for the relative acceptability of the Scandinavian structures. One of the possible ways to analyze these structures is to assume that they are not formed by syntactic movement at all. They may thus violate island constraints, since different syntactic processes govern

their derivation. Languages for which non-movement analysis of relative clauses and certain question types has been proposed are some Scandinavian languages, Swedish in particular (Maling;1987), modern Irish (McCloskey:1990), and Serbo-Croatian (Goodluck:1992; Progovac:1992). One of the aims of linguistic theory is to establish whether these structures can be subsumed under a different setting of the movement parameter and therefore need not respect island constraints, or whether they are instances of application of principles of grammar that obviate Subjacency effects.

## Chapter Two

### 2. LONG-DISTANCE BINDING IN SERBO-CROATIAN

#### 2.1. Wh-movement in Serbo-Croatian

Before turning to the issue of long-distance Wh-extraction in Serbo-Croatian, some questions concerning the rules that govern its application need to be addressed. Wh-movement in Serbo-Croatian applies at the level of Surface Structure and, as a syntactic operation, obeys a number of constraints on movement observed in English and in many other languages. Extraction out of an embedded question, as well as out of a Complex Noun Phrase, would create ungrammatical structures, as shown in the examples below.

##### Wh-Island

7.\*[<sub>CP</sub>Koga Jelena pita [<sub>CP</sub> zašto je ostavila]]

who Jelena asks why aux3PsPr left

(\*Who<sub>i</sub> does Jelena ask why she has left t<sub>i</sub>?)

##### Complex Noun Phrase Constraint

8.\*[<sub>CP</sub>Koga je Jelena čula[<sub>NP</sub> trač[<sub>CP</sub>da je ostavila]]]

who aux3PsPr Jelena heard gossip comp aux3PsPr left

(\*Who<sub>i</sub> did Jelena hear the gossip that she left t<sub>i</sub>?)

Obedience to island constraints is taken as evidence for the existence of syntactic Wh-movement in Serbo-Croatian. The landing site of a moved Wh-word is an A-bar position, i.e., the SpecCP (as noted by Rudin:1986), and movement creates an

A-bar chain through which the case of the Wh-word is transmitted. The trace left by the movement operation is subject to the Empty Category Principle.

Serbo-Croatian offers another strategy, which allows violations of the island constraints mentioned above. Consider the grammatical counterparts of 7. and 8.

9. [<sub>CP</sub>Za koga<sub>i</sub> Jelena pita [<sub>CP</sub>zašto ga<sub>i</sub> je ostavila]]

for who Jelena asks why him aux left

(\*Who<sub>i</sub> does Jelena ask why she has left him<sub>i</sub>?)

10[<sub>CP</sub>Za koga<sub>i</sub> je Jelena čula[<sub>NP</sub>trač [<sub>CP</sub>da ga<sub>i</sub> je ostavila]]]

for who aux Jelena heard gossip comp him aux left

(\*Who<sub>i</sub> did Jelena hear the gossip that she has left him<sub>i</sub>?)

It was proposed (Progovac:1992) that the constructions above are not formed by movement, but that they represent long-distance pronominal binding between the pronoun in the embedded clause and Za+Wh, probably subject to Principle B of the Binding theory. The aim of this section is to provide an analysis of the grammar of these long-distance binding structures.

Before I address each aspect of Za+Wh constructions separately, a brief summary of the distribution of these structures will be given. Za+Wh structures are subject to a number of restrictions. They are in complementary distribution with the structures formed by Wh-movement, i.e. whenever Wh-movement is ungrammatical Za+Wh improves the construction, otherwise it is unnecessary.

Za+Wh constructions are disallowed with subject extraction out of a subjunctive clause serving as a complement to an obligatory subject control verb. Wh-movement renders grammatical structures here, as well as for object extraction out of subjunctive clauses across the complementizer *da\_*('that'). In all other instances of extraction, only Za+Wh strategy will yield grammatical structures. Apart from tense/mood, intervening complementizer/Wh-island, lexical, and extraction site restrictions, there is another restriction governing the domain of Za+Wh application. The domain for pronominal linkage in Za+Wh structures must be long-distance, subject to Principle B binding. These structures exhibit the ability to link not only to overt pronominal categories (e.g. clitic pronouns in object position), but also to the empty categories (pro) in the embedded clause subject position. Let us now consider the distribution of Wh-movement versus Za+Wh strategy, with respect to subject/object extraction from subjunctive/indicative complementizer clauses, as shown in Table 1 below.

	Wh-movement		Za+Wh	
	Subject	Object	Subject	Object
Subjunctive				
That	-	+	+	<del>+</del>
Wh	-	-	+	+
Indicative				
That	-	<del>+</del>	+	<del>+</del>
Wh	-	-	+	+

Table 1: The distribution of Wh-movement and Za+Wh.

## 2.2. ECP and Subject/Object Asymmetry

### 2.2.i. ECP and That-t Effect

The subject/object asymmetry caused by the lack of proper government for subject traces (as shown for English in the examples below), obtains in Serbo-Croatian, as noted by Progovac (1992).

11.a. Who<sub>i</sub> do you think t' t<sub>i</sub> loves Mary?

11.b.\*Who<sub>i</sub> do you think t' that t<sub>i</sub> loves Mary?

12.a. Who<sub>i</sub> do you think t' Mary loves t<sub>i</sub> ?

12.b. Who<sub>i</sub> do you think t' that Mary loves t<sub>i</sub> ?

It is generally assumed that the intermediate traces can govern the initial traces. As noted by Lasnik and Saito (1984), and subsequently Chomsky (1986b), the complementizer that blocks proper government for the subject trace (example 11.b.). However, the same effect does not obtain for the object trace in 12.b., since it is already theta-governed by the verb. The contrast between the examples 11.a. and b. is due to the ECP. As first proposed by Lasnik and Saito (1984), the English complementizer that, having no semantic content of its own, can be deleted at LF, but its overt presence affects the ECP (example 11.b.), by blocking proper government.

Consider the following Serbo-Croatian examples.

13.\*Ko<sub>i</sub> misliš da t<sub>i</sub> je voleo Jelenu?

who think comp aux loved Jelena

(Who do you think (\*that) loved Jelena?)

14.Koga<sub>i</sub> misliš da je Jelena volela t<sub>i</sub>?

who think comp aux Jelena loved

(Who do you think that Jelena loved?)

The ungrammaticality of 13. can now be compared to the same effects obtained in the corresponding English example (11.b.) with the overt complementizer. The Serbo-Croatian complementizer *da* has different properties than its English counterpart *that*. It can introduce subjunctive clauses, indicative clauses, conditional clauses and yes/no questions (where the question particle *li* incorporates into *da*). The verb in the matrix clause directly governs the choice of the feature that the complementizer will spread onto the subordinate clause. Even though the semantic content of the complementizer *da* is transparent (like some English *that*s, but unlike *for*, *whether* and *if*) and even though the features it bears [+/- indicative/subjunctive; +/-Wh; etc.] are spread onto the subordinate clause, it can never be deleted.<sup>4</sup> Its obligatory overt presence blocks government and causes an ECP violation.

The problem, however, is complicated in Serbo-Croatian, since it was claimed for Italian, and some other Romance null subject languages (Rizzi:1982) that ECP violations can be avoided by postposing the subject first to a postverbal

position, and then extracting out of that position.<sup>5</sup> Several proposals have been made about different ways in which languages avoid That-v effects,<sup>6</sup> and the analysis by Zubizarreta (1982) of the Portuguese data can offer the explanation of the same effects in Serbo-Croatian. She claims that the postposed subject undergoes a Focus rule (adopting Perlmutter's 1976 analysis) in Portuguese. This rule converts the focussed element into an operator-variable structure. Thus, the same focussed NP cannot undergo Wh-movement, since it would be bound by two distinct operators. To put it briefly, postposed NPs in Portuguese undergo the Focus rule, which is incompatible with the Wh-movement rule. The same analysis of subject postposing<sup>7</sup> can be applied to the Serbo-Croatian examples. Namely, ECP violation does result from the That-t effect, since the subject cannot be extracted from a postposed position and the obligatory presence of *da* blocks the government of its trace.

#### 2.2.ii. Subject/Object Asymmetry

It has been observed (Progovac:1992) that the subject/object asymmetry is even sharper with Subjunctive-like verbs. I will try to show that this is due to a number of factors, in particular to tense/mood, and the empty category (pro vs PRO) in the subject position of the embedded clause. In order to provide an analysis consistent with the one applied to the English examples, I will first compare the

syntactic differences between the Croatian and Serbian variants and the extent to which they affect the structures under analysis. Due to diachronic changes and geographical factors, the eastern (Serbian) variant has almost completely lost its infinitival constructions, which have been replaced by the da+Subjunctive constructions, whereas the western (Croatian) variant has retained them. Consider the parallelism between the two structures:

15.a. Marko<sub>i</sub> pokušava da PRO<sub>i</sub> zaboravi Jelenu. (Serbian)

Marko tries comp PRO forget Jelena

(Marko tries to forget Jelena)

15.b. Marko<sub>i</sub> pokušava PRO<sub>i</sub> zaboraviti Jelenu. (Croatian)

Marko tries PRO forget Jelena

(Marko tries to forget Jelena.)

I here adopt the PRO analysis (Browne:1986; Progovac:1992) for the structures above. The obligatory subject control thus gives rise to the ungrammaticality of the following examples.

16.a. \*Ko<sub>i</sub> Marko<sub>i</sub> pokušava da t<sub>i</sub> zaboravi Jelenu?

16.b. \*Tko Marko<sub>i</sub> pokušava t<sub>i</sub> zaboraviti Jelenu?

who Marko tries comp forget Jelena

(\*Who<sub>i</sub> does<sub>i</sub> Marko try to t<sub>i</sub> forget Jelena?)

Basing the analysis on the PRO theorem on the ungoverned nature of PRO and its complementary distribution with a

pro/lexical NP, the ungrammaticality of 16.a. and b. results from the inability of PRO to undergo any type of Wh-movement. Consider the example below, in which the matrix clause subject has moved short-distance to SpecCP.

17.a.  $Ko_i t_i$  pokušava da PRO zaboravi Jelenu?

17.b.  $Tko_i t_i$  pokušava PRO zaboraviti Jelenu?

who tries (comp) forget Jelena

(Who tries to forget Jelena?)

The examples above demonstrate that only short-distance Wh-movement of the top clause subject is possible when the embedded clause subject position is filled by PRO. Extraction out of the subject position filled by a lexical NP, out of the subjunctive clause would, on the other hand yield ungrammatical structures due to the ECP violation.<sup>8</sup>

18. Marko hoće da Petar upozna Jelenu.

Marko wants comp Petar meet Jelena

(Marko wants Peter to meet Jelena.)

19. \* $Ko_i Marko_j$  hoće da  $t_i$  upozna Jelenu?

who Marko wants comp meet Jelena

(Who does Marko want to meet Jelena?)

Compare this to the obligatory subject control verbs with which the non-overt subject in the embedded clause has to be PRO. Questioning out of the subject (short distance), or

object (long-distance) position does not violate ECP. The following examples once again illustrate this assumption.

20.  $Ko_i t_i$  pokušava da  $PRO_i$  zaboravi Jelenu?

who tries comp forget Jelena  
(Who tries to forget Jelena?)

21.  $Koga_j$  Marko $_i$  pokušava da  $PRO_i$  zaboravi  $t_j$ ?

who Marko tries comp forget  
(Who does Marko try PRO to forget?)

To sum up, subjunctive clauses allow long-distance Wh-movement across the complementizer *da* from within the object position only, while the extraction possibilities out of the subject position are determined by the category occupying it (PRO vs NP/pro). This analysis would be referred to later in the study to explain the reasons why some of *da*+Subjunctive clauses do not allow Long-Distance Binding between a non-overt subject and the initial *Za*+Wh.

Let us consider once again the verbs selecting the complementizer *da*+Indicative. The non-overt subject in the embedded clause behaves as *pro*, as illustrated in the following examples.

22.  $Marko_i$  kaže da  $e_{i/j}$  je zaboravio Jelenu .

Marko says comp aux forgot Jelena.  
(Marko says that he has forgotten Jelena.)

23. Ko<sub>i</sub> t<sub>i</sub> kaže da pro<sub>i</sub> je zaboravio Jelenu?

who says comp aux forgot Jelena

(Who says that he has forgotten Jelena?)

24. \*Ko<sub>j</sub> Marko<sub>i</sub> kaže da t<sub>j</sub> je zaboravio Jelenu?

who Marko says comp aux forgot Jelena

(Who does Marko say that has forgotten Jelena?)

The structure in 24 cannot be improved even if the matrix clause verb would bear different person and gender features, such as the following:

25. \*Ko<sub>j</sub> oni<sub>i</sub> kažu da t<sub>j</sub> je zaboravio Jelenu?

who they say comp aux forgot Jelena

( Who do they say has forgotten Jelena?)

This suggests that not the possibility of double antecedents, but the ECP violation, accounts for its ungrammaticality. Object extraction is grammatical, patterning again with the subject/object asymmetry observed in English. Although extraction out of indicative clauses is generally analyzed as ungrammatical,<sup>9</sup> it seems to be acceptable with a bridge verb in the main clause (see example 14.). These structures will furthermore show the same sensitivity to Wh-islands that holds for their English counterparts (but unlike Bulgarian and Romanian, which will be analyzed in the following section).

The aim of this section was to show that Wh-movement in Serbo-Croatian is sensitive to:

1. Island constraints.
2. The Empty Category Principle.
3. The verb in the matrix clause which may subcategorize for the different types of complementizer clauses, whose subject positions are filled by different empty categories.

### 2.3. Wh-islands Revisited

#### 2.3.i. Bulgarian

As already claimed and supported by the examples in the previous section, extraction out of either Complex NPs, embedded indirect questions or relative clauses is ungrammatical in Serbo-Croatian. Some useful conclusions regarding the alternative strategies for obtaining long-distance relations can be drawn from comparisons, with respect to movement constraints, with the behavior of other Slavic languages, Bulgarian in particular. As Rudin (1988) noted, regarding the structure of the languages that allow multiple Wh-fronting, two types of languages can be distinguished: Bulgarian and Romanian, that place all the fronted Wh-words in the SpecCP, and Serbo-Croatian, Polish, and Czech, in which only one fronted Wh-word can occupy the SpecCP position. I will not concentrate here on the issue of multiple Wh-fronting, but use it as a starting point to show some more properties along which the latter group of languages patterns itself, and differs from the former one.

The main issue at this point is to show how and to what degree these languages obey the constraints on movement, in particular the Wh-island. As predicted by Comorowski (1986), and later elaborated on by Rudin (1988), Wh-phrases do not represent islands for languages in which all the fronted Wh-words occupy the Comp position. This prediction is confirmed by the Bulgarian and Romanian data, where no blocking effects on movement induced by medial Wh-words obtain, and Doubly Filled Complementizer Filter does not hold. Another group of languages, however, does not tolerate Wh-island violations.<sup>10</sup> Rudin noted that extraction out of an embedded question in Bulgarian is less acceptable than extraction out of a relative clause, as shown in the Bulgarian example taken from Rudin (example 20.b) annotated here as 26.a.:

26.a.? Koja ot tezi knigi se čudiš koj znae koj prodava?

which of these books wonder-2s who knows who sells

Which of these books do you wonder who knows who sells?

In footnote 11 of her article, Rudin gives the example of a much more acceptable construction, the non-movement analysis of which is partially attributed to the heaviness of the extracted Wh-phrase. The example is given here as 27.b.:

27.b.Za koja ot tezi knigi se čudiš koj znae koj prodava?

for which of these books wonder-2s who knows who sells

For which of these books do you wonder who knows who sells?

Interestingly enough, it is not only 'heavy' Wh-phrases that would allow this construction. Consider the following Bulgarian examples.

28.a.Kogo se čudiš da li sam sreštnal ?

28.b.Za kogo se čudiš da li sam go strešnal?

(for) who refl wonder comp part aux (him) met

(for/who do you wonder if I met (him)?)

29.a.Kogo se čudiš kogdo sam strešnal?

29.b.Za kogo se čudiš kogdo sam go strešnal?

(for) who refl wonder when aux (him) met

(for/who do you wonder when I met (him)?)

It has been confirmed by the Bulgarian speakers that I have consulted that the latter construction (examples 28.b. & 29.b.) is far less acceptable and even sounds archaic. Note that the object pronoun is obligatory in the embedded clause, and that this structure is identical to the Serbo-Croatian one, to be analyzed in detail in the following section. The first question that anyone trying to resolve the issue of island constraints in Bulgarian may want to address is the existence of the Za+Wh strategy. This

strategy serves to repair a perfectly grammatical construction derived by Wh-movement, since it has been shown that Wh-words do not create islands in this language. Intuitively, one should seek the answer in historical linguistics, possibly due to the fact that Za+Wh strategy represents the older stage in the development of the Bounding Theory in Bulgarian. This is the stage at which Wh-islands had to be obeyed in the same way as they have to be in present-day Serbo-Croatian. Whatever caused resetting the parameter in Bulgarian cannot be traced at this point.

### 2.3.ii. Serbo-Croatian and Slovenian

Let us move a little further to the north, and concentrate on Serbo-Croatian, and another closely related South Slavic language, Slovenian. All of the ungrammatical structures dealt with in the previous section, can be saved by Za+Wh strategy. We will consider first extraction out of an indicative clause, as well as extraction out of an embedded yes/no and Wh-question. Recall that subject extraction was ungrammatical due to the ECP, and that Wh-movement out of an object position across the complementizer *da* was producing grammatical structures only with bridge verbs. Consider the following pairs of examples.

30.a.\*Ko<sub>i</sub> misliš da t<sub>i</sub> je voleo Jelenu?

30.b.Za koga<sub>i</sub> misliš da t<sub>i</sub> je voleo Jelenu?

for/\*who think comp aux loved Jelena

( For/\*who do you think loved Jelena?)

31.a.Koga<sub>i</sub> misliš da je Jelena volela t<sub>i</sub> ?

31.b.Za koga<sub>i</sub> misliš da ga<sub>i</sub> je Jelena volela t<sub>i</sub> ?

for/who think comp him aux Jelena loved

(For/who do you think that Jelena loved ?)

As it can be observed, the ungrammaticality of subject extraction is saved by Za+Wh strategy, and further it is possible to use Za+Wh strategy for object extraction. It has to be emphasized that za koga constructions, contrary to those in Bulgarian, are acceptable and used by the Serbo-Croatian speakers as frequently as the verbs subcategorizing for the corresponding complementizer clauses.

Let us turn now to the extraction out of an embedded yes/no question. I will here use similar examples to the ones in Bulgarian (28.a.&b.), for the ease of comparison.<sup>11</sup>

32.a.\*Koga<sub>i</sub> se pitaš da li sam upoznala t<sub>i</sub> ? (SC)

33.a.\*Kogo<sub>i</sub> se sprašuješ, ali sem spoznala t<sub>i</sub> ? (SL)

32.b.Za koga<sub>i</sub> se pitaš da li sam ga<sub>i</sub> upoznala t<sub>i</sub>?(SC)

33.b.Za kogo<sub>i</sub> se sprašuješ, ali sem ga<sub>i</sub> spoznala t<sub>i</sub>?(SL)

for/\*who refl wonder comp/part aux him met

(Who do you wonder if I have met (him)?)

Serbo-Croatian and Slovenian pattern in that they disallow both subject and object extraction out of embedded yes/no questions without *za*. Before proposing the syntactic analysis for the *za koga* structures, let us examine the other environments in which they can or must occur. It has already been said that Wh-islands have to be obeyed in Serbo-Croatian (the same holds for Slovenian), and they are most diagnostic of whether the movement operation has applied or not. Recall that the a. examples shown in the following set were perfectly grammatical in Bulgarian (example 29.a.).

34.a.\*Koga<sub>i</sub> se pitaš kada sam srela t<sub>i</sub>? (SC)

35.a.\*Kogo<sub>i</sub> se sprašuješ, kdaj sem srela t<sub>i</sub>? (SL)

34.b.Za koga<sub>i</sub> se pitaš kada sam ga<sub>i</sub> srela t<sub>i</sub>? (SC)

35.b.Za kogo<sub>i</sub> se sprašuješ, kdaj sem ga<sub>i</sub> spoznala t<sub>i</sub>? (SL)

for/\*who refl wonder when aux him met

(\*Who do you wonder when I met (him)?)

The structure cannot be improved even if the clitic pronoun, the status of which will be discussed in detail later, was introduced. The same island effects obtain with subject extraction.

The examples above have illustrated that except for the object extraction out of an embedded subjunctive, both subject and object extraction out of embedded indicative clauses, yes/no, and Wh-questions is ungrammatical with the Wh-movement operation in Serbo-Croatian.<sup>12</sup> In all these

cases question formation will use Za+Wh strategy. There still remains the question of why Za+Wh strategy is disallowed in some of the embedded subjunctive clauses. Since object extraction is acceptable with Wh-movement with the bridge verbs, Za+Wh strategy is still necessary for extraction across other types of verbs. Recall that subject extraction, when the embedded clause subject is pro/NP, is ungrammatical with Wh-movement. Consider the example 16.a., repeated here in example 36, in which subordinate clause subject is PRO.

36.\*Ko<sub>i</sub> Marko<sub>j</sub> pokušava da t<sub>i</sub> zaboravi Jelenu?

who Marko tries comp forget Jelena  
 (Who<sub>i</sub> does Marko want t<sub>i</sub> to forget Jelena?)

The ungrammaticality of this example can be explained by the fact that PRO can undergo neither short nor long Wh-movement. However, not only Wh-movement, but also the Za+Wh strategy is ungrammatical (example below).

37.\*Za koga<sub>i</sub> Marko pokušava da PRO<sub>j</sub> zaboravi Jelenu?

for who Marko tries comp forget Jelena  
 (\*Who<sub>i</sub> does Marko try t<sub>i</sub> to forget Jelena?)

Recall that the analysis of Za+Wh relies on the notion of pronominal binding and that PRO cannot undergo Principle B, having both the features [+anaphor,+pronominal]<sup>13</sup>. The only way to form a question is short-distance Wh-movement of the matrix clause subject, as shown in 38. below.

38. Ko<sub>i</sub> t<sub>i</sub> pokušava da PRO<sub>i</sub> zaboravi Jelenu?

who     tries             comp             forget             Jelena  
(Who<sub>i</sub> t<sub>i</sub> tries PRO<sub>i</sub> to forget Jelena?)

It is therefore not true to claim that Za+Wh strategy is disallowed with subjunctive complements. The distribution of Wh-movement, and Za+Wh strategy, regarding subject extraction, is due to different empty categories occupying this position. Since objects can Wh-extract out of subjunctive complements, and because their position cannot be occupied by an empty category, Za+Wh would represent an unnecessary strategy.

#### 2.4. The Grammar of Long-Distance Rules in Serbo-Croatian

The aim of this section is to propose an analysis for the Za+Wh constructions. The question of whether these constructions represent "the last resort strategy" or not (Progovac:1992,23) cannot be resolved at this point since, as already shown in the previous sections, depending on whether subject or object extracts across the *da* complementizer or a Wh-island will determine whether Wh-movement or Za+Wh strategy will be used. What can be claimed however, is that the choice between Wh-movement and Za+Wh strategy is lexically restricted.<sup>14</sup> A more important question is whether the restrictions on Za+Wh are the result of lexical specification alone or the interaction of principles of grammar with lexical subcategorization

features of the verb. The verbs subcategorizing for the Subjunctive complements with the obligatory subject control would not tolerate the Za+Wh strategy for subject extraction, and thus use Wh-movement as the only available option. All the other matrix clause verbs, that belong to the class that allows Za+Wh strategy, will, irrespective of the presence of islands, use this strategy for both subject and object extraction.

Having established the distribution of these two complementary strategies, let us now examine the domain in which Za+Wh strategy applies. As noted by Progovac (1992:22) "za koga strategy is never available for local extraction". Consider the examples below (examples 66 and 67:Progovac), annotated here as 38. and 39., which support this analysis.

39.\*Za koga<sub>i</sub> pro<sub>i</sub> voli Jelenu?

for who                    loves    Jelena  
(Who loves Jelena?)

40.\*Za koga<sub>i</sub> ga<sub>i</sub> Jelena voli?

for who    him Jelena    loves  
(Who does Jelena love?)

The analysis proposed by Progovac, which I adopt in this study, is that these structures represent a language-specific application of the Principle B of the Binding Theory. In order to show how this analysis works, I will first examine the status of the pronouns in object

extraction and then try to propose a similar analysis for the empty categories in the subject position.

Recall that Principle B requires that pronouns must be bound outside their governing category, which automatically excludes any possibility of having local dependencies. This is exactly the situation that obtains in Za+Wh constructions. Recall also that the clitic pronoun is obligatory with long-distance dependency between Za+Wh and object position in the embedded clause (the same requirement holds for Slovenian, as well as for the Bulgarian Za+Wh structures).

Consider first the examples:

41.a. Jelena<sub>i</sub> se pita kada pro<sub>i/j</sub> je upoznala Petra.

Jelena    refl wonders when pro    aux    met            Peter

41.b. Jelena<sub>i</sub> se pita kada pro<sub>i/j</sub> ga<sub>k</sub> je upoznala t<sub>k</sub>.

Jelena    refl wonders when pro    him    aux    met

(Jelena wonders when she met Peter<sub>k</sub>/him<sub>k</sub>.)

Without going into detailed analyses of the status of pronominal clitics in Serbo-Croatian, I assume that the clitic *ga* ('him') surfaces in the clause-second position. Contrary to what has been proposed for some other languages (Shlonsky:1992 for Hebrew and Palestinian), object pronouns in the Za+Wh questions are obligatory and not the

'last resort strategy'. Their obligatory nature can be related to:

1. The Principle B nature of Za+Wh structures, which therefore makes them distinct from French or English resumptives appearing in some Wh-movement constructions.
2. The fact that Serbo-Croatian is not a 'null object' language.

Let us now consider the Za+Wh question corresponding to the examples above, and see how the Principle B analysis works.

42. Za koga<sub>k</sub> se Jelena<sub>i</sub> pita kada pro<sub>i/j</sub> ga<sub>k</sub> je upoznala?

for who refl Jelena wonders when pro him aux met  
(\*Who<sub>k</sub> does Jelena wonder when she met him<sub>k</sub>?)

The pronoun *ga* ('him') is coindexed outside its governing category, and behaves exactly like any other pronoun in Serbo-Croatian regarding the binding possibilities, except that it has to be bound by Za+Wh. This binding can apply across a number of clauses, as shown in the example below, and resembles the use of resumptive pronouns in some variants of English.

43. Za koga<sub>i</sub> se Marko pita da li je podsetio Jelenu

for whom refl Marko wonders comp part aux reminded Jelena  
da pita Petra kada ga<sub>i</sub> je upoznao.  
comp ask Peter when him aux met.

(\*Who<sub>i</sub> does Marko wonder if he reminded Jelena to ask Peter when he had met him<sub>i</sub>?)

It has been demonstrated that Principle B could account for the link between Za+Wh and an overt clitic pronoun referring to the object position. Let us now consider the subject extraction with Za+Wh strategy.

44. Za koga<sub>i</sub> Jelena kaže da pro<sub>i</sub> je upoznao Petra?

for who Jelena says comp pro aux met Peter

(Who does Jelena say met Peter?)

It has been established before that the empty category in the embedded clause subject position cannot be the Wh-trace nor PRO, since the former would violate the ECP, and the latter disallows Za+Wh constructions. I exclude the possibility that it can be NP-trace, either. What I want to propose here is that the embedded clause subject position in Za+Wh structures can be filled by pro only. Consider the following pair of sentences.

45. Marko<sub>i</sub> misli da pro<sub>i/j</sub> je došao.

46. Marko<sub>i</sub> misli da je on<sub>j</sub> došao.

Marko thinks comp pro aux he came

(Marko thinks that pro/he has come.)

Example 46 shows that the obviation effects induce the requirement for the overt NP in the subject position of the

embedded clause in pro-drop languages to have disjoint reference.<sup>15</sup> I will try now to examine the binding possibilities for pro with respect to Principle B analysis of Za+Wh. Consider the following example.

47. Za koga<sub>i</sub> Marko<sub>j</sub> misli da pro<sub>i</sub> voli Jelenu?

for whom Marko thinks comp pro loves Jelena

(Who does Marko think loves Jelena?)

It has already been mentioned that the object position has to be filled by a pronoun and not the Wh-trace, as the latter would yield an ungrammatical structure and eliminate the linking possibilities with Za+Wh. The subject position, on the other hand, has to be filled by pro for the following reasons:

1. There are no clitic subject pronouns in Serbo-Croatian.
2. Since the obligatory binding by Za+Wh imposes the requirement for disjoint reference, an overt pronoun in the embedded clause subject position would make this construction sound unnatural.
3. PRO, NP-trace, or Wh-trace are excluded from these environments.
4. Pro, having the features [-anaphor;+pronominal] and given that all the other conditions obtain, must be bound outside its governing category.<sup>16</sup>

Let us consider now the distribution of categories in Za+Wh structures that are bound by the Za+Wh, subject to Principle B binding.

	Subject	Object
Subjunctive	pro	pronoun
Indicative	pro	pronoun

The analysis outlined above seems to support the claim that in the Za+Wh constructions, clitic pronouns in the object position and pro in the subject position, obey Principle B of the Binding theory in the same way.

## Chapter Three

### 3.1. LANGUAGE ACQUISITION

#### 3.1.i. Language Acquisition and Universal Grammar

Chomsky (1965) outlined the major issues concerning the innate knowledge of universal grammar that guides a child in arriving at a system of rules compatible with the input speech he is exposed to. The notion of universal grammar refers to a set of universal principles and the corresponding parameters which may vary crosslinguistically. Acquisition principles, on the other hand, help the child to come to a 'parameter setting' of a principle governing the adult grammar. The nature of acquisition principles proposed by various models of language development has been a topic of on-going debate (see, for example, Wexler & Culicover: 1980; Berwick:1985; Roeper & Williams:1987).

The acquisition of Wh-movement has been of particular interest, since languages vary with respect to the level at which it applies and correspondingly, the constraints governing its use. The basic parameter according to which languages differ is whether syntactic movement exists or not. The aim of this study is to provide data concerning the initial setting of the movement parameter.

#### 3.1.ii. The Subset Principle

An approach based on the notion of the Subset Principle as proposed by Berwick (1985), provides one possible account

of learning paths in the acquisition of movement. Under the Subset Principle the learner's output language has to be the smallest one that is consistent with the evidence (which we will idealize as non-existent in the initial stages of acquisition). Since movement in the syntax is governed by island constraints, the output language will be restricted if movement is the first hypothesis. If a movement analysis is assigned to the initial grammar, several consequences follow:

1. This analysis presupposes the existence of multilevelled representation in child grammar, so that movement rules can apply 'in the syntax'.
2. Learners of languages that do not use movement in the syntax will have to remove the movement operation from their grammar to achieve a larger output language not governed by the constraints on movement in their syntax.
3. Children learning languages that use both movement and non-movement strategies for long-distance dependencies, e.g., Serbo-Croatian, will not only have to keep the initial parameter, but also to add to it a mechanism to allow the larger output language for the appropriate constructions. For instance, knowledge of other syntactic processes governing the use of non-movement operation (e.g., pronominal binding) will have to be incorporated into a child's grammar.

### 3.1.iii. Acquisition Paths

Although the movement-initial hypothesis fits in an appealing manner with the dictates of the Subset Principle, the assumption that the child's initial grammar contains a level of Surface Structure is itself controversial. An alternative view would be to assume that initially the child has only LF movement and a very liberal grammar of long-distance linking. Development would then involve the introduction of a level of S-Structure, and applying movement at that structure where appropriate. One possible learning path can be hypothesized, as shown below.

Stage I : LF only (LF and S-Structure are isomorphic).

Stage II : Syntactic movement (introduction of S-Structure):

- a. Without successive cyclic movement.
- b. Introduction of successive cyclic movement.

Stage III: a. Across the board movement in the syntax.

- b. Construction-by-construction relaxation.

The existence of LF only in the initial stage of acquisition is intuitively plausible on the basis of the universal character of this level. When the learner is faced with two ways of forming questions, none of which apply at LF, he will have to introduce an additional level, S-Structure into his grammar.<sup>17</sup> After S-Structure, and the corresponding syntactic movement has been incorporated into the learner's grammar, certain learning principles may guide him in choosing the right parameter. Assuming that the child

initially uses the movement analysis in a blanket manner (the parameter is set to, e.g. value 0: 0=movement; 1=non-movement), the first phase will thus represent the most restricted stage in learning. All the possible constraints on movement will be strictly respected. In the second phase of learning the output language is expanded as the data (positive evidence in the Subset Principle analysis), warrants. The non-movement analysis is applied to appropriate structures, and the parameter value is changed to 1 if needed. If a language uses both movement and non-movement options, construction-by-construction relaxation would help the child to incorporate both settings of the parameter into his grammar.

We address here only Stages II and III development as they are relevant for the application of learning principles in the course of language acquisition. The Minimalist framework analysis (Chomsky:1992) would imply the earlier existence of isomorphism between LF and S-Structure (Stage I above). A grammatical change would trigger the introduction of an additional level. On the other hand, the developmental analysis proposed above contradicts the minimalist approach since it does not propose the adoption of the most economical analysis.

#### 3.1.iv. The Role of Input

One should, however, address the often ignored question of the sufficiency of the input the child receives and its relation to the order in which certain structures get acquired. It seems plausible to assume that the acquisition of the structures for whose formation two different settings of a parameter are required, would be to a certain degree, subject to the frequency of these structures in the language the child is exposed to. It has been noted by Cromer (1987) that experience of a structure (the more frequent exposure to it), irrespective of the feedback the child receives, may accelerate the acquisition, thus motivating the internal processes (i.e. parameter resetting in our model) to operate. One should therefore be careful not to claim that the bad performance children show on certain construction types entails a lack of knowledge of the principles governing these structures. It may just as well indicate that the grammar of a specific structure has not been activated due to insufficient input the child receives.

I will assume the acquisition model outlined in 3.1.iii., but will not exclude the possibility that input may also play a significant role in acquiring some complex language-specific constructions.

### 3.2. BACKGROUND

#### 3.2.i. Acquisition of Movement Rules<sup>18</sup>

The fact that testing children's sensitivity to island constraints plays the major role for establishing the initial setting of the movement parameter was first noted by Otsu (1981). He tested children's knowledge of blocking the extraction from within a relative clause. Otsu was the first to use a potentially ambiguous question technique, later adopted in most of the studies of the knowledge of island constraints. The questions he used can be exemplified by the following structure:

48. What is Jane drawing a monkey that is drinking with?

There are two logically possible answers to this question, depending on the structure assigned. The only correct answer is, e.g., 'a pencil', whereas the answer, e.g., 'a straw', would yield an ungrammatical structure, since it entails attaching the prepositional phrase to a position inside the relative clause. If children gave correct responses to these types of question, this could be used to support the claim that they know that the extraction from within a relative clause is not permitted. Although the results reported in this study were not clear-cut, there was some evidence for the existence of movement rules in children's grammar after about age five. The objection that has often been raised is that Otsu's experiment lacked control sentences, since the

test sentences with islands were always compatible with short distance extraction.

Subsequent studies have shown that the 'strength' of islands (CNPC; Wh-island; Temporal island; Subject island) varies in child performance. Different experiments (deVilliers, Roeper & Vainikka:1990; Goodluck, Foley & Sedivy:1992; Philip & de Villiers:1992) have attempted to assess the sensitivity to various properties of island phenomena. A study by deVilliers, Roeper and Vainikka (1990) was designed to test children's sensitivity to the properties of an intervening Wh-word in long-distance Wh-extraction. Their experiment was a picture-cued response task in which subjects were presented with short stories, followed by a complex question, potentially ambiguous with respect to the site of extraction for the Wh-word. The test questions used were constructed with initial Wh-word and medial Wh-word/zero complementizer (an example of test question is given below).

49. How<sub>i</sub> did Kermit ask t<sub>i</sub> who to help \*t<sub>i</sub> ?

Respecting islands, and the sensitivity to their 'strength', triggered by the different properties of arguments and adjuncts, was tested to determine children's knowledge of long-distance movement rules. Younger children (aged 3:7 to 5) performed poorly on these tasks and de Villiers et al. suggested that it may be attributed to the lack of successive cyclic movement in their grammar. The younger

children's responses, however, seem to reveal another mechanism that led to this poor performance. For instance, the fact that they were misled more often by medial argument than by medial adjunct could imply sensitivity to islands, which had led them into making more errors when searching for a possible referent. Children aged five or more showed their sensitivity to Wh-islands and the rules for long-distance extraction. However, the claim made about the non-movement analysis in children's initial grammar lacks firm support. The bad performance of the younger children may also be caused by cognitive difficulty which questioning out of an embedded Wh-question creates, and not by the lack of sensitivity to Wh-islands.

Although there were problems with the Otsu and de Villiers et. al. studies, their data has produced evidence that seems to support the idea that the initial grammar of the language learner does involve the application of the movement rules.

A study by Goodluck et.al. (1992) was designed to test children's knowledge of the constraint on extraction from within a temporal clause. The questions used were designed in the manner of the following example:

50. Who<sub>i</sub> did the dog chase t<sub>i</sub> before/after asking \*t<sub>i</sub> ?

The results are clear, appearing to strongly support the claim that children as young as three obey this constraint.

However, it has been argued that the clarity of their results may be artifactual (the result of a processing routine: Saah:1993, based on The Completeness Constraint on Binding, by Goodluck & Finney:1992).

Another study by Lillo-Martin (1992) tests the sensitivity to islands in American Sign Language and 'escape rafts' techniques children employ to save the structures whose formation would violate island constraints. The data showed that although children made changes in their responses (using resumptive pronouns in cases where gaps would violate islands), they performed in accord with the grammar of their language. Lillo-Martin has concluded that, even at the youngest age tested (3:2 years), children obeyed the constraints of the grammar of the ASL.

The Serbo-Croatian experiment uses a picture cued ambiguous question response task to test children's sensitivity to the differences between Long-Distance Wh-movement and Long-Distance Binding in two almost parallel structures. The cognitive difficulty of questioning out of an embedded question is the same in both koga and za koga structures. If it produced any effect on children's responses, its significance should be the same for LD Wh-movement and LDB.

Since the Principle B analysis for these structures has been adopted, it may prove useful to address some questions concerning the acquisition of the Binding Theory as well.

### 3.2.ii. Acquisition of the Binding Theory

Many studies have tested how children acquire the principles of the Binding Theory (Manzini & Wexler:1987; Solan:1987;McDaniel, Cairns & Hsu:1987;Goodluck:1987; Chien & Wexler:1987). The order in which the three principles are acquired and the strategies that guide children in finding a domain corresponding to a certain pronominal have been studied extensively. The principles of the Binding Theory are:

Principle A: An anaphor must be bound within its GC.

Principle B: A pronoun must be free in its GC.

Principle C: A referential expression must be free.

(where GC stands for governing category).

In the following example:

51. Mary knows that John killed him/himself.

Principle A requires that the reflexive himself be bound by John; Principle B requires that the pronoun him must be free in its local domain; however Principle C determines that the referential expressions Mary and John must be free everywhere.

The basic finding of the experiments mentioned above, which is pertinent to our study, is that children make more errors with Principle B than with Principle A. This has often been attributed to the fact that experiments test performance, and that bad performance on certain tasks cannot be equated with a lack of competence of the

structures the tasks were designed to elicit. The errors they make often result from the difficulties children have when applying some aspects of their knowledge into sentence processing and not from a lack of the knowledge itself.

## Chapter Four

### 4. THE STUDY

#### 4.1. Serbo-Croatian Project

This experiment, designed to test children's knowledge of LDB, is part of a larger project on the acquisition of movement rules in Serbo-Croatian. The study consists of five different experiments testing the acquisition of Wh-movement in relative clauses and questions, as well as the interaction between some aspects of the Binding and Bounding theory in child grammar. The study was designed throughout the 1992/93 school-year, and carried out in May and June 1993 in Novi Sad, Yugoslavia.

The following experiments comprise the study:

1. Eliciting relatives formed by movement.
2. Eliciting relatives formed by non-movement.
3. Acting-out both types of relatives.
4. Long-Distance Binding experiment.
5. Principle B experiment (act-out).

The study is divided into two main parts: relative clause acquisition, and LDB acquisition. Results from both sets of experiments can be used either in separate studies referring to a certain aspect of child grammar, or combined to shed more light on basic acquisition principles. Results from the relative clause experiment will be reported elsewhere. The data from the Principle B experiment will bear on interpretations of both studies.

## 4.2. Long-Distance Binding Experiment in Serbo-Croatian

### 4.2.1. Goals

The primary goal of the study was to test children's sensitivity to long versus short-distance binding in questions. Serbo-Croatian uses two different strategies for long-distance binding/movement. These operations are subject to the restrictions induced by the initial *koga* versus *za koga*, as shown in section 3. Questions with *koga* are formed by Wh-movement and obey all the movement constraints, whereas the *za koga* questions require long-distance binding, irrespective of the presence of islands. Testing children's sensitivity to the contrast between Wh-movement versus Long-Distance Binding in two almost parallel structures was the main question this study was designed to address.

A secondary goal was to test children's knowledge of the restrictions on Wh-movement induced by Wh-islands. Medial Wh-islands intervening in the movement path yield ungrammatical results with all the structures formed by Wh-movement, while their presence does not affect binding possibilities for Za+Wh constructions.

### 4.2.2 Experimental Design

#### 4.2.2.i. Conditions

The experiment was designed in a way that enabled us to address both the primary and the secondary goal of the study. The language itself offers the possibility of

creating minimal pairs of sentences that can test both knowledge of Long-Distance Binding, as well as knowledge of the Bounding Theory, with particular emphasis on sensitivity to the island constraints. The test sentences consisted of two conditions, for each of which both koga and za koga questions could be created. The conditions are represented in the diagram below.

- 1) Koga je Vesna pitala da li ga je upoznao?  
who aux3PsPr Vesna asked comp part him aux3PsPr met  
 -----OK-----\*
- 2) Koga je Vesna pitala kada ga je upoznao?  
who aux3PsPr Vesna asked when him aux3PsPr met  
 -----OK-----\*
- 3) Za koga je Vesna pitala da li ga je upoznao?  
for who aux3PsPr Vesna asked comp part him aux3PsPr met  
 -----\*-----OK-----
- 4) Za koga je Vesna pitala kada ga je upoznao?  
for who aux3PsPr Vesna asked when him aux3PsPr met  
 -----\*-----OK-----

Conditions 1 and 2 test knowledge of the restrictions on the Wh-movement. The medial da li (in 1) and the Wh-word (in 2) create islands, blocking long-distance extraction out of an indirect yes/no question, as well as out of an embedded Wh-question. Only a top clause reading can be assigned in conditions 1 and 2. Questions represented by the conditions 3 and 4, on the other hand, require long-distance binding (between the Za+Wh and the pronoun in the embedded clause), and top clause reading is ungrammatical. This design enables us to test, by comparing the responses in conditions 1 and 2 to the responses in conditions 3 and 4, children's

sensitivity to short versus long-distance binding /extraction. Furthermore, it enables us to test their sensitivity to non-overt/overt medial islands, by comparing the responses to conditions 1 and 3 to the responses to conditions 2 and 4.

The experiment consisted of 12 stories, 6 with medial da li, and 6 with an overt medial Wh-word. For each of the stories either a koga or za\_koga question can be constructed, which enabled us to give three tokens of each of the conditions above to each subject. The questions were randomized beforehand and each subject received:

- a. 3 koga questions : Medial da li
- b. 3 za\_koga questions : Medial da li
- c. 3 koga questions : Medial Wh
- d. 3 za\_koga questions : Medial Wh

#### 4.2.2.ii. Materials

In order to construct a perfectly symmetrical design that would enable us to create minimal pairs of potentially ambiguous question types, a number of other possible ways to test the distinctions between za\_koga and koga questions had to be excluded. This is related both to a number of asymmetries (to be discussed in this section), as well as to the lexical restrictions of the verbs subcategorizing for za\_koga questions, that may both destroy the symmetrical design, and potentially lead to unclear and unreliable data. The idea was to elicit, in the initial stages of studying

the acquisition of these complex structures, responses under the most restrictive, 'uncomfortable' conditions.

#### 4.2.2.iii. Arguments versus Adjuncts; *ko* versus *šta*

No attempt to establish sensitivity to the distinctions between arguments and adjuncts with respect to their properties regarding long-distance extraction is made in this study. Long-Distance Binding is tested for arguments only, because:

1. Za+Wh question types do not allow 'adjunct' Long-Distance Binding.<sup>19</sup>
2. The 'strength' of arguments and adjuncts differs with respect to their islandhood properties.

Serbo-Croatian has, like English, two arguments: *ko* ('who') and *šta* ('what'). I propose that only sentences with *ko* will give clear-cut results. The reasons why the Za+*šta* questions are not included in the study are as follows.

1. Consider first the following examples.

52. \**Šta<sub>i</sub> se Petar pita kome smo dali t<sub>i</sub>?*

what refl Peter wonder to whom aux gave

(\*What<sub>i</sub> does Peter wonder who we gave t<sub>i</sub> to?)

51. *Za šta<sub>i</sub> se Petar pita kome smo \*to/!ga/!je<sub>i</sub> dali?*

for what refl Peter wonder to whom aux it/ him/ her gave

(\*For what<sub>i</sub> does Peter wonder who we gave it<sub>i</sub> to?)

The clash between the animacy features of šta [-animate] and the corresponding resumptive pronoun to which it is linked yields an almost ungrammatical structure for many speakers. The pronoun to ('it') is not a clitic pronoun in Serbo-Croatian<sup>20</sup>, and Za+Wh forms a link with a clitic resumptive pronoun, never with a full pronoun, as shown in the diagram in section 2. Other resumptive pronouns (ga 'him', je 'her') are marked [+animate] and would cause a clash between two opposite features [+ vs - animacy]. Thus sta was unsuitable for our design because of possible animacy clashes with resumptive pronouns.<sup>21</sup>

2. Phonologically, Za+šta could easily merge into Zašta, which is almost identical to zašto (why). The problem is even greater in the Croatian variant, that uses the form što corresponding to the form šta.<sup>22</sup> Thus sta was also potentially confusable with another question form, and this led us to exclude it from the experimental conditions.

#### 4.2.2.iv. Subjunctive versus Indicative

As shown in detail in section 3., the distribution of Wh-movement and Za+Wh strategy in subjunctival complements is not only sensitive to island constraints, but also to the empty category occupying the subject position. No such distinctions obtain with indicative complements, which disallow extraction (except for the relative acceptability of object extraction across the complementizer with bridge

verbs). Because the whole experiment was based on the most restrictive, yet very clear condition types, extractions out of subjunctive complements and the indicative ones across a bridge verb were excluded from the design. The conditions that we used tested the sensitivity to the distribution of Wh-movement and Za+Wh questions in indicative complementizer clauses introduced by an island to movement. Since these are the instances in which long-distance Wh-movement is disallowed and Za+Wh strategy is obligatory, this design enabled us to have pairs of critical examples with a minimum of mixed condition types.<sup>23</sup>

#### 4.2.2.v. Subject versus Object Extraction

Recall that subject extraction across the complementizer *da* was ungrammatical due to the ECP violation, and that the same result obtains when the medial element is a Wh-word, due to the Wh-Island constraint. Object extraction is blocked by the Wh-island only. For the sake of making the experiment simple for the children to follow, but complex enough to provide reliable results, the idea of having both subject and object condition was abandoned, and only Wh-movement/LDB with respect to the object position was tested.<sup>24</sup>

#### 4.2.2.vi. Lexical Restrictions

To test children's sensitivity to differences between these two structures, questions have to be potentially ambiguous with respect to the position of reference. They are all unambiguous in adult grammar, but potentially misleading for children, regarding the possibility of assigning either top or bottom clause reading.

To construct potentially ambiguous minimal pairs a verb in the main clause should:

1. Belong to the class of verbs taking both koga and za koga questions.
2. Be optionally transitive (to create the possibility of having two equally plausible extraction sites)
3. Take as its internal argument an animate NP marked accusative.
4. Not be a bridge verb.
5. Be able to take a complementizer clause introduced by either da li or a Wh-word.

There seems to be only one verb in Serbo-Croatian, i.e., pitati ('ask'), that can satisfy all of the conditions above, as well as the goals of this study. This verb was therefore used in matrix clauses in all experimental questions. A single case method, as noted by Clark (1973), thus seems to be the only available one for studying structure for which language itself offers a limited set of elements to choose from.<sup>25</sup>

### 4.3. Principle B Experiment

#### 4.3.1. Goals

This experiment was designed to test children's comprehension of pronominal binding, since the Long-Distance Binding in Za+Wh question types was analyzed (Progovac:1992, as shown in section 3.) as a language-specific application of the Principle B of the Binding Theory. The goals of this experiment were:

1. To test children's sensitivity to domain restrictions.
2. To rule out the possibility of linear response bias.
3. To provide a check on the interpretation of errors with Za+Wh question types.

Since domain restrictions play a major role in assigning pronominal reference for both Principle B binding, as well as for Long-Distance Binding ('outside its GC'), one of the goals of the experiment was to establish whether children know the domain restrictions for binding. Another goal was to rule out a generalized response bias in experimental circumstances to chose first/last NP. This component of the experiment is vital in interpreting the data from the Long-Distance Binding experiment. The general literature on the acquisition of the Binding Theory would make linear strategy very implausible. This experiment provides a check that any generalized preference for short or long-distance binding in the LDB experiment is not due to a blanket use of linear strategies. Finally, it was

necessary to establish the extent to which possible errors with Long-Distance Binding in Za+Wh questions are caused by the lack of knowledge of the Binding Theory.

#### 4.3.2. Experimental Design

##### 4.3.2.i. Conditions

There were three conditions in the experiment: two conditions designed to test the knowledge of Principle B, and a third condition contrasting it with the knowledge of Principle A. The two conditions for Principle B tested the short (clitic) form and the full form of the pronoun. Principle A condition included only the clitic form of the reflexive pronoun. The conditions were as follows.

1) Saša<sub>i</sub> hoće [ da ga<sub>i/j</sub> Piter<sub>k</sub> uštine].

Sasa wants comp him Peter pinch

(Sasa wants Peter to pinch him.)

2) Saša<sub>i</sub> kaže [ da je Piter<sub>k</sub> na njega<sub>i/j</sub> skočio]

Sasa says comp aux3PsPr Peter on him jumped

(Sasa says that Peter has jumped on him.)

3) Saša<sub>i</sub> kaže [ da se<sub>j</sub> Piter<sub>j</sub> ogrebao].

Sasa says comp himself Peter scratched

(Sasa says that Peter has scratched himself.)

In condition 1 the pronominal clitic is in the clause-second position, as required by Wackernagel effects in Serbo-Croatian, and the full form of the pronoun is introduced after the preposition in condition 2. These two conditions control each other for the use of a linearity principle. Taking the closest N to the left in the condition with the full pronoun form (condition 2) is disallowed by Principle B.<sup>26</sup> Condition 3, with the reflexive pronoun, contrasts knowledge of Principle A with Principle B. It ensures that long-distance choice of the referent is not the only option available to the child. Correct performance on all three conditions rules out use of either a first NP strategy (correct for conditions 1 and 2 but incorrect for condition 3), or a nearest NP strategy (correct for condition 3 but incorrect for 1 and 2).

#### 4.3.2.ii. Materials

The experiment consisted of three tokens of each sentence type. Each subject received, in a random order (out of three blocks corresponding to three conditions), nine sentences to act out. Two verbs were used in the matrix clause: *hteti* ('want'), which takes an subjunctive complementizer clause, and *kazati* ('say'), which takes an indicative complementizer clause; both subordinate clause types are introduced by the complementizer *da*. The tense in the subordinate clause and the type of complementizer do not affect the binding possibilities. The verbs in the

subordinate clauses in the conditions 1 and 2 were transitive and those in condition 3 were the ones that could also assign a reflexive reading (e.g. scratch: cond.1 'him'; cond. 3 'himself').

#### 4.4. Subjects

##### 4.4.i. Experimental Group

All the child subjects tested had acquired Serbo-Croatian as their first language and were not fluent in any other language. They attend a nursery school in Novi Sad, in the north of Yugoslavia, where standard Serbo-Croatian is spoken. Their mental and physical development is normal, and not, to my knowledge, affected by the present political situation in the country. There were three age groups (4,5,& 6), 14 subjects in each, comprising in total 42 children (22 girls and 20 boys). All child subjects were tested in two sessions, approximately 20 minutes for each, and the responses were both written down and tape recorded.

##### 4.4.ii. Control group

A control group of 8 adults, aged 17 to 35, was also tested. Their excellent performance on all tasks confirmed the initial assumption that the tasks we used can provide reliable data about the existence of pertinent constructions in Serbo-Croatian, and adults' familiarity with all the structures tested. It also provided further support for the initial hypotheses that we had set regarding their

grammaticality, as all the adults performed in accord with our analysis of the grammar of Long-Distance Binding (as outlined in Section 3; and can be seen from their results as shown in the Table 2 in Section 4.5.).

#### 4.5. Analyses

##### 4.5.i. Long-Distance Binding Experiment

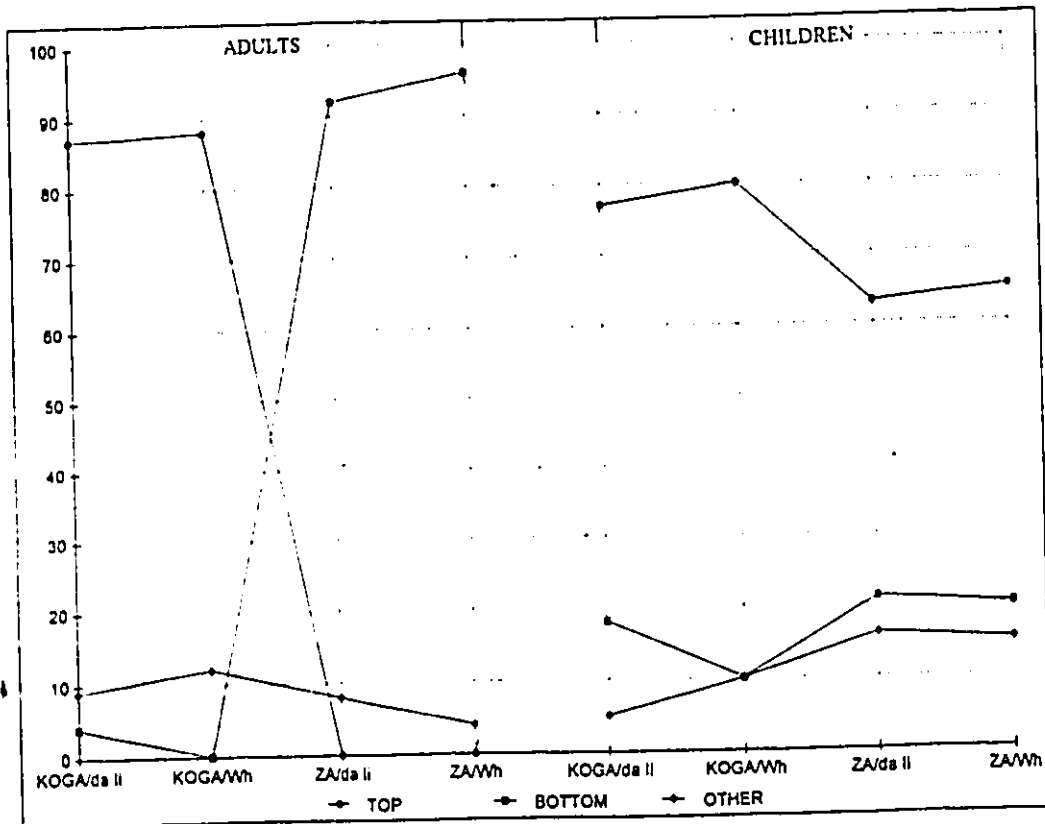
As mentioned already, all four question types were potentially ambiguous for the children, regarding the extraction site for *koga/za\_koga*. Their responses were classified as either top (the matrix clause reading was assigned), bottom (the subordinate clause reading was assigned), or 'other' (when subjects chose neither top nor bottom clause reading, gave an irrelevant response, or no answer at all). Table 2 shows the responses for the child (n=42) and adult (n=8) subjects, represented in mean scores and percentages.

	CHILDREN			ADULTS			
	TOP	BOTTOM	OTHER	TOP	BOTTOM	OTHER	
KOGA/da li	2.30 77	.54 18	.14 5	2.62 87	.12 4	.24 9	means percent
KOGA/Wh	2.40 80	.28 10	.30 10	2.62 88	0	.37 12	means percent
ZA/da li	1.88 63	.64 21	.47 16	0	2.74 92	.24 8	means percent
ZA/Wh	1.95 65	.59 20	.47 15	0	2.87 96	.12 4	means percent

Table 2 Mean score and percentages of top clause, bottom clause, and other responses for child and adult subjects

The numbers in Table 2 show that adults gave almost all top clause readings (87/88%) for *koga* question types, treating both *da\_li* and Wh-words as islands to Wh-movement. Only 4% bottom clause readings with *da\_li* were given, confirming that extraction out of yes/no questions was not allowed.

Za koga questions, on the other hand, were given bottom clause readings almost categorically by adults (92/96%). Children's responses showed overall preference for top clause reading, for both koga and za koga question types, together with slight sensitivity to medial Wh/da li (18/10%); a small trend for za towards long-distance binding irrespective of islands (10/20%), and a higher number of 'other' responses for za koga questions (15/31%). Adults' and children's results are also represented in the graph form (Graph 2) below.

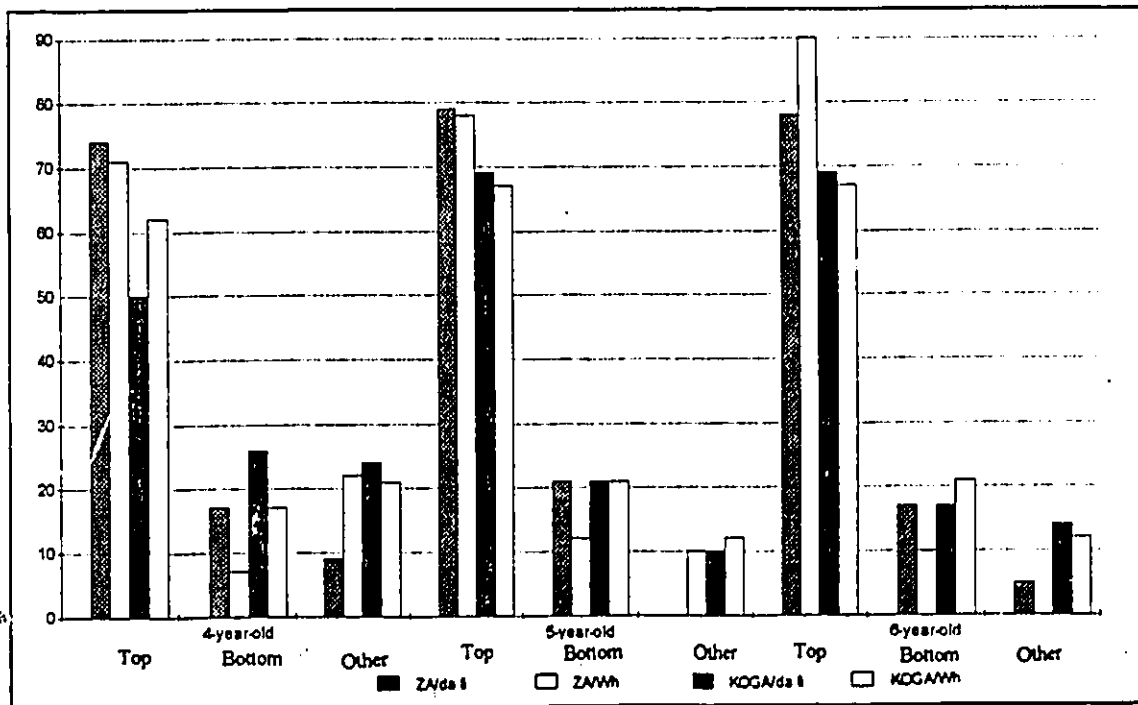


Graph 2 : Top clause, bottom clause, and 'other' responses by children for the 4 condition types.

Table 3 shows the distribution of the responses across the age groups. The same results are represented in Graph 3 below.

	4-year-old			5-year-old			6-year-old		
	TOP	BOTTOM	OTHER	TOP	BOTTOM	OTHER	TOP	BOTTOM	OTHER
KOGA/da li	2.48 74	.47 17	.28 9	2.35 79	.64 21	0	2.35 78	.42 17	.14 5
KOGA/Wh	2.14 71	.21 7	.64 22	2.35 78	.35 12	.28 10	2.71 90	.28 10	0
ZA/da li	1.50 50	.78 26	.71 24	2.07 69	.64 21	.28 10	2.07 69	.49 17	.42 14
ZA/Wh	1.85 62	.49 17	.64 21	1.99 67	.64 21	.35 12	1.99 67	.64 21	.35 12

Table 3 Mean score and percentages for top clause, bottom clause, and other responses by children (by age groups)



Graph 3: Top clause, bottom clause, and 'other' responses by children (by age groups) for the 4 conditions

A planned comparison analysis of variance (ANOVA) was carried out and the results are shown in Table 4.a. The results for each of the conditions below, split by age groups, are given in the Appendix 4.

	Top			Bottom			Other		
	DF	F	p	DF	F	p	DF	F	p
Age	2,39	2.12		2,39	.12		2,39	5.23	.009
da li/Wh	1,39	.49		1,39	2.38		1,39	.93	
za/Wh	1,39	8.47	.006	1,39	1.81		1,39	8.20	.007
ZAxWH	1,39	.00		1,39	2.14		1,39	1.32	

Table 4.a. ANOVA table for 42 child subjects, representing different interactions of the four condition types.

As Table 4.a. shows, the following effects were significant:

1. Presence of za for top responses, reflecting a drop in proportion of top responses when za was present.
2. Presence of za in questions with da li/Wh, reflecting an increase in 'other' responses when za was present.
3. Age was a significant factor for questions with medial Wh (present/absent) and za (present/absent) and the interaction of these two condition types for 'other' responses, reflecting a drop in proportion of 'other' responses with age increase.

An additional analysis of the presence of medial Wh in koga and za koga questions was carried out and the results are represented in Table 4.b. below.

		Top			Bottom			Other		
		DF	F	p	DF	F	p	DF	F	p
KOGA da li/Wh	Age	2,39	1.35		2,39	.30		2,39	5.47	.008
	Cond	1,39	.30		1,39	4.33	.044	1,39	3.86	.056
	Cond*Age	2,39	.70		2,39	.17		2,39	3.39	.044
ZA da li/Wh	Age	2,39	.98		2,39	.04		2,39	2.22	
	Cond	1,39	.24		1,38	.18		1,39	.00	
	Cond*Age	2,39	.95		2,39	1.26		2,39	.09	

Table 4.b. ANOVA table for 42 child subjects, representing the analyses of two by two condition types

The results of this analysis show that the following effects were significant.

1. The presence of medial Wh for questions where za was absent, reflecting a decrease in proportion of bottom responses.
2. The presence of medial Wh for questions where za was absent, reflecting an increase in 'other' responses with medial Wh.
3. Age was a significant factor for presence of medial Wh in koga questions, reflecting a drop in 'other' responses with an overt Wh-island as children get older.

Two additional ANOVAs were carried out, from which 4 child subjects, who gave more than 75 % of the responses in accord with the adults' responses, were excluded in order to determine the extent to which their good performance determined the effects found in the total child data.

	Top			Bottom			Other		
	DF	F	p	DF	F	p	DF	F	p
Age	2,35	3.15	.055	2,35	1.41		2,35	5.42	.009
da li/Wh	1,35	.76		1,35	2.86		1,35	.83	
za/Wh	1,35	3.87	.057	1,35	.03		1,35	8.50	.006
ZAxWH	1,35	.02		1,35	1.82		1,35	1.32	

Table 5.a. ANOVA table for 38 child subjects, representing different interactions of the four condition types.

		Top			Bottom			Other		
		DF	F	p	DF	F	p	DF	F	p
KOGA da li/Wh	Age	2,35	1.83		2,35	.36		2,35	5.39	.009
	Cond	1,35	.35		1,35	4.26	.046	1,35	3.57	
	Cond*Age	2,35	.74		2,35	.13		2,35	3.34	.047
ZA da li/Wh	Age	2,35	1.73		2,35	1.73		2,35	2.24	
	Cond	1,35	.46		1,35	.45		1,35	.00	
	Cond*Age	2,35	1.05		2,35	1.06		2,35	.09	

Table 5.b. ANOVA table for 38 child subjects, representing the analyses of two by two condition types

As shown in the tables above, slight differences in significance levels are found when the four subjects are excluded. In the second ANOVA, age becomes near a significance factor for top responses ( $p < .055$ ). All the other factors have almost the same significance value as in the analysis of the total child data. These two analyses have demonstrated that the general pattern of responses (as shown in Tables 2 and 4a. & b) cannot be due to some of the subjects' excellent performance.

To sum up the basic findings of the analyses:

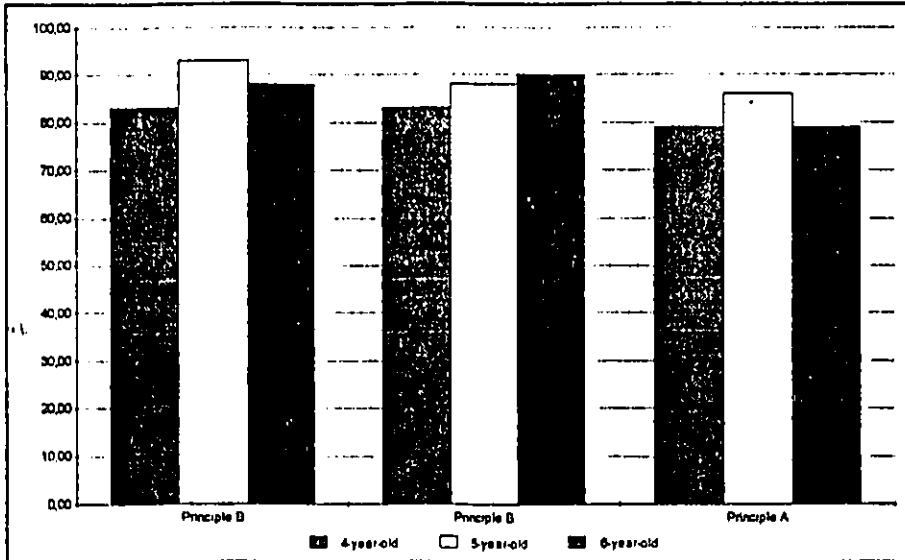
1. Children preferred giving top responses, not discriminating between different structures.
2. Children gave a significantly higher number of 'other' responses for za\_koga than for koga question types.
3. The youngest children gave less bottom clause responses to za\_koga questions with a medial Wh.

4.5.ii. Principle B Experiment

The results from this experiment show very good performance by children for both Principle B and Principle A structures. There were no significant differences between the conditions, although there was a trend towards more incorrect responses with Principle A than with Principle B. The results are represented in mean values and percentages in Table 6, and the corresponding graph representation is also given (Graph 6).

Age	Principle B clitic	Principle B no clitic	Principle A	
4-year-old	2.50 83	2.50 83	2.36 79	means percent
5-year-old	2.79 93	2.64 88	2.57 86	means percent
6-year-old	2.64 88	2.71 90	2.36 79	means percent
TOTAL	2.64 88	2.61 87	2.43 81	means percent

Table 6 The results by children for the 3 condition types.



Graph 6 : The results by children for the 3 condition types tested.

## Chapter Five

### 5.1. Study of Results

This study has brought up more questions than it was designed to address, and has given us some evidence about the existence of certain movement rules in the initial child grammar. The results from the Principle B experiment clearly show that children as young as four know the Binding Theory. More related to the primary goal of the whole study is the fact that the scrambling operation, which places clitics in the clause-second position, does not affect binding possibilities, and all children tested showed sensitivity to this constraint. Their excellent performance on the task that tested knowledge of the Binding Theory satisfied the main goals of the Principle B experiment. It confirmed that:

1. Children are sensitive to domain restrictions (only the choice of the right domain accounts for assigning correct binding relations).
2. Children are not biased by the linear strategy when searching for the antecedent for the pronoun/reflexive, but use structural representation of a sentence. The possibility of linear response bias is ruled out by the good performance on condition 2 and conditions 1 and 3, where any linear strategy would give wrong results in at least one case.
3. The most important finding of this experiment is that knowledge of Binding Theory is not responsible for their

errors with Long-Distance Binding structures, and that the cause for their bad performance should be sought elsewhere.

The results from the Long-Distance Binding experiment are not so clear-cut, yet some aspects, if not all, of both the primary and the secondary goal of the study are addressed.

Children preferred giving top clause responses, irrespective of the structure. Their responses to *koga* questions indicate their sensitivity to the presence of medial Wh-islands. This sensitivity increases with age, so that the oldest children tested performed almost like adults (only 10% bottom clause responses). The youngest children, however, gave a significantly higher number of 'other' responses with Wh-islands, but this dropped to zero by the age of six. This may suggest that even the youngest children's grammar has the movement rules and the constraints governing their use. Their awareness of the islands causes confusion in searching for a response, that may lead them into higher error rate. Recall that similar analysis was proposed for de Villiers et. al. results, where the youngest children tested had a higher error rate with medial arguments than with medial adjuncts. These results thus suggest that child grammar of Serbo-Croatian is sensitive to the rules and constraints of Wh-movement.

When it comes to Wh-movement across *da li*, a number of children, irrespective of their age, allowed extraction out of embedded yes/no questions. This may imply that yes/no

questions do not create as strong islands as Wh-questions do in child grammar. Furthermore, it may suggest that children know the rules for long-distance Wh-movement, but that those children who gave bottom clause responses across da li still apply it across the board in their grammar.

Let us now consider the main issue of the study, namely the acquisition of the Long-Distance Binding structures. The data shows that children, even by the age of six, have not acquired the grammar of Long-Distance Binding in Serbo-Croatian. They treated Za+Wh structures very similarly to the manner in which they treated Wh-movement structures. Medial Wh-island was respected, irrespective of the requirement for long-distance binding. One of the most suggestive findings is the significantly higher number of 'other' responses when *za* was present, which drops slowly as children get older. Although details of the data remain unclear, it is evident that child grammar of Serbo-Croatian lacks the rules that govern Long-Distance Binding.

## 5.2. Implications of the Results for the Problem of Acquisition of Long-Distance Binding

This study was designed to test what children know, but has only given us a clear answer of what they do not know, even by the age of six. Children know the rules for Wh-movement and show varying degrees of sensitivity to island constraints, which is compatible with the findings from

other language acquisition studies. Since this study was not designed to test the acquisition of movement operation only, it is difficult, given the mixed (movement and non-movement strategies) design and unclear data, to draw any conclusions regarding the acquisition paths hypothesized in Chapter three. But it is evident that what is lacking in child grammar, even at the age of six, is a clear sensitivity to the different rules that govern the two distinct ways of question formation. The fact that activation of the final stage of acquisition, the introduction of a non-movement operation in forming questions, has not yet been triggered in their grammar can account for the children's bad performance on Za+Wh structures.

The data from the Principle B experiment shows that the grammar of the Binding Theory is activated before the age of four. Thus something else has to account for the late appearance of a language-specific application of the Binding Theory in question formation.<sup>27</sup> One can hypothesize a number of possible causes for this phenomenon.

1. Since there was only one verb used in all the test conditions, errors with LDB structures may have been caused by the lack of subcategorization rules for this verb. This is very implausible however, as the subcategorization features for the verb are in no direct way related to the syntactic issues addressed here.<sup>28</sup> Further, it is one of the verbs that is very frequent in the language and has been

used in many similar acquisition studies (cf. de Villiers et.al.:1989; Philip & de Villiers:1992).

2. Children lack the 'experience' of Za+Wh structures (as shown for similar language-specific structures in English by Cromer:1987). Although the number of verbs subcategorizing for Za+Wh structures is limited, they are the verbs used often in the everyday language. One may thus claim that children have not received evidence in the speech around them (i.e. they have not heard za\_koga questions) sufficient enough to activate the grammar of these structures.<sup>29</sup>

3. The inability to elicit the expected responses may simply be due to an inappropriate design. Recall that the experiment was designed with the most restrictive conditions in mind. If children had done well on these conditions, one could have claimed that they knew the rules of the structures under analysis. If they had performed badly, as our subjects did, the evidence is not sufficient enough to claim that their grammar completely lacked the Za+Wh question formation strategy. To put it simply, the task may have been too difficult to perform, given the lexical restrictions, cognitive difficulties and practical limitations we imposed on our subjects. We are presently carrying out a follow-up study, that has biasing (towards long-distance reading) conditions, and is designed to test extraction out of Subjunctive complements (that allow extraction in many more cases than Indicative complements do.)

### 5.3. Implications for Future Research

A number of syntactic issues, some directly and some indirectly related to the problem of Long-Distance Binding, have been raised throughout the study. I will address here a number of questions that cannot be solved at this point, but will have to be dealt with in future. One of them deserves a separate section, since it is important not only for linguistic theory, but also for language acquisition studies.

#### 5.3.i. Wackernagel Effects and the Binding Theory

The analysis of the Binding Theory in Serbo-Croatian has to take into account some language-specific properties of pronouns and reflexives. Since Serbo-Croatian is one of the languages with Wackernagel effects, all pronominal clitics must surface in the clause-second position. Consider the following examples.

54. Petar<sub>i</sub> se<sub>i</sub> povredio.

Petar      refl   hurt

(Peter has hurt himself.)

The corresponding full form would be inside the VP, as in:

55. Petar<sub>i</sub> je povredio sebe<sub>i</sub>, ne Marka.

Petar      aux   hurt              refl      not Marko

(Peter has hurt himself, not Marko.)

The c-command relation between Petar and the reflexive se ('himself') makes it possible for the rules of Principle B

to make these two categories coreferential. Consider now an example with the reflexive in the embedded clause.

56. Marko kaže da se<sub>i</sub> Petar<sub>i</sub> povredio.

Marko says comp refl Petar hurt

(Marko says that Peter has hurt himself.)

The reflexive in the subordinate clause has moved to the second position and since the first position is occupied by the complementizer, the subject remains in the position commanded by the reflexive. This is contrary to Principle A of the Binding theory, but since the binding does obtain in cases like this, an explanation has to be given. I then conclude that cliticization, presumably an instance of a scrambling operation, does not affect binding possibilities (unlike in Hindi, for example, where it feeds binding: Mahajan:1990). Children's good performance on these sentence types can be used as additional evidence that they have acquired principles governing scrambling rules and presumably other movement operations as well.

Let us now consider an example with a pronoun in the embedded clause.

57. Marko<sub>i</sub> kaže da ga<sub>i/j</sub> je Petar<sub>k</sub> povredio.

Mark says comp him aux Petar hurt

(Mark says that Peter has hurt him.)

Even when the pronoun is cliticized to the clause-second position, the c-command relation between the pronoun and the embedded clause subject does not play any role, since Principle B excludes binding within the same governing category. The scrambling operation could thus be 'blamed' if Serbo-Croatian speaking children perform worse on Principle A than on Principle B, contrary to the findings from other languages. This could lead to some interesting studies in future, in which testing younger children (3- and 4-year-olds) on similar structures may reveal not only the age at which children acquire Bounding and Binding Theories, but also role that certain acquisition principles play in child grammar.

### 5.3.ii. Syntactic Problems

One of the problems for the theory of movement rules in Serbo-Croatian is to offer an analysis that accounts for the subjunctive/indicative distinctions with respect to extraction possibilities. Wh-movement out of indicative complementizer clauses is disallowed irrespective of the presence of islands, whereas it is allowed out of subjunctive clauses across the complementizer *da*. It has been proposed (Progovac:1992) that subjunctive clauses allow domain extension, since the absence of tense features on the verb makes Infl/Comp complex deletable, and eventually recoverable at LF. An alternative analysis, based on Subjacency, may account for this asymmetry. Namely, if

one adopted the proposal that CP is an inherent barrier in Serbo-Croatian, and that IP becomes a barrier if Infl has the feature [+tense], extraction of indicative clauses would always cross two barriers to movement, and violate Subjacency.<sup>30</sup>

Another problem is That-t effects that obtain with subject extraction in Serbo-Croatian. Extraction out of embedded subjunctive clause subject position violates the ECP, since the complementizer is not deletable at LF, and one barrier (CP) suffices to block proper government of traces. One has to seek an explanation for why Rizzi's proposal for subject postposing and subsequent extraction out of postverbal position cannot be applied to Serbo-Croatian. A possible explanation can be found in Zubizarreta's analysis of subject postposing in Portuguese, and the incompatibility of the Focus Rule with the other movement rules. My feeling is that this is the most adequate analysis at this point, but that some other aspects (related to government, control theory, null subject theory etc.) need to be explored in detail before offering a final analysis. Related to this issue is the problem of non-deletable character of complementizers in Serbo-Croatian, probably due not only to tense, but also to mood features they bear, and the more general problem of the elements that may undergo LF deletion.

Another issue, very briefly addressed in this study, is that of Control Theory in Serbo-Croatian. This is also

related to the un/governed properties of PRO (in light of recent proposals by Chomsky and Lasnik) and the features it bears [+anaphor;+/-pronominal]. This study has also raised the question of the ability of the empty categories to undergo binding in the same way as their overt counterparts do. It has to be established whether null subject languages allow their pro subjects to undergo Principle B binding, on the basis of their [+pronominal] feature, respecting the same binding constraints that hold for lexical NPs.

## Appendix 1

### Long-Distance Binding Experiment

#### Part A: Medial da li

1.

Zoran će sledeće nedelje slaviti svoj rođendan.  
On i mama su jutros razgovarali o tome koga je sve pozvao.  
Mama ga je pitala: "Da li si pozvao i svog drugara Sašu?"  
- Mama je napravila tortu za rođendan.-

Zoran will have a birthday party next week.  
He and mom talked this morning about who was invited.  
Mom asked him: "Have you invited your friend Sasa?"  
- Mom has made a birthday cake.-

a. Koga je mama pitala da li ga je pozvao?  
who aux3PsPr mom asked comp part him aux3PsPr invited  
(Who did mom ask if (he) had invited him?)

b. Za koga je mama pitala da li ga je pozvao?  
for whom aux3PsPr mom asked comp part him aux3PsPr  
invited  
(Who did mom ask if (he) had invited him?)

2.

Zoranov tata će voditi Zorana na fudbalsku utakmicu.  
Saša kaže da bi i on voleo da ide.  
Zoran kaže: "Pitaću tatu da li će i tebe povesti."  
- Evo njihovog omiljenog fudbalera.-

Zoran's dad will take him to a football match.  
Sasa says that he would like to go too.  
Zoran says: "I'll ask my dad if he wants to take you too."  
- This is their favourite football player.-

a. Koga će Zoran pitati da li će ga povesti?  
who aux3PsFt Zoran ask comp part aux3PsFt him take  
(Who will Zoran ask if (he) will take him?)

b. Za koga će Zoran pitati da li će ga povesti?  
for whom aux3PsFt Zoran ask comp part aux3PsFr him  
take  
(Who will Zoran ask if (he) will take him?)

3.

Vesna će ići na maskenbal. Mama će je obući u princezu.  
Sanja je tužna jer ne zna kako da se obuče.  
Vesna kaže: "Pitaću moju mamu da li će i tebe obući."  
- Evo Vesne kako ide na maskenbal.-

Vesna will go to a masked ball. Mom will dress her as a princess.  
Sanja is sad because she does not know how to dress.  
Vesna says: "I'll ask my mom if she'll dress you too."  
- Here is Vesna going to the ball."

- a. Koga će Vesna pitati da li će je obući?  
who aux3PsFt Vesna ask comp part aux3PsFt her dress  
(Who will Vesna ask if (she) will dress her?)
- b. Za koga će Vesna pitati da li će je obući?  
for whom aux3PsFt Vesna ask comp part aux3PsFt her dress  
dress  
(Who will Vesna ask if (she) will dress her?)

4.

Teta Dana, mamina stara prijateljica, je došla u goste.  
Vesna joj je otvorila vrata.  
Teta Dana se iznenadila koliko je Vesna porasla.  
Zoran je pitao Vesnu: "A da li si ti prepoznala teta Danu?"  
- Mama je u međuvremenu kuvala kafu.-

Auntie Dana, mom's old friend, has come to visit them.  
Vesna answered the door.  
Auntie Dana was surprised to see how tall she has grown.  
Zoran asked Vesna: "Have you recognized Auntie Dana?"  
- Meanwhile mom was making coffee.-

- a. Koga je Zoran pitao da li ju je prepoznala?  
who aux3PsPr Zoran asked comp part her aux3PsPr recognized  
(Who did Zoran ask if (she) had recognized her?)
- b. Za koga je Zoran pitao da li ju je prepoznala?  
for whom aux3PsPr Zoran asked comp part her aux3PsPr recognized  
(Who did Zoran ask if (she) had recognized her?)

5.

Zoran je sanjao da je bio u životinjskom carstvu.  
Tamo se upoznao sa mnogim životinjama.

Kad je on otišao, žirafa je pitala slona: "A da li si ti upoznao Zorana?"

- I onda je žirafa prilegla da se malo odmori.-

Zoran dreamt that he had visited animal kingdom.  
There he met many animals.

When he left, the giraffe asked the elephant: "And have you met Zoran?"

- Then the giraffe lied down to have some rest.-

a. Koga je žirafa pitala da li ga je  
who aux3PsPr giraffe asked comp part him aux3PsPs  
upoznao?  
met  
(Who did giraffe ask if (he) had met him?)

b. Za koga je žirafa pitala da li ga je  
for whom aux3PsPr giraffe asked comp part him aux3PsPr  
upoznao?  
met  
(Who did giraffe ask if (he) had met him?)

6.

Zorana boli stomak. Mama kaže da će ga voditi kod doktorice.  
Zoran kaže: "Ne boli me više." i Vesna mu kaže da je kukavica.

Zoran kaže Vesni: "Ako me i dalje budeš zadirivala, pitaću doktoricu da li će i tebe pregledati?"

- Zoran je popio sirup i nista ga više nije bolelo.-

Zoran has a stomach ache. Mom says she'll take him to the doctor.

Zoran says: "It does not hurt me any more." and Vesna tells him that he is a coward.

Zoran tells Vesna: "If you go on teasing me, I'll ask the doctor if she wants to examine you too."

- Zoran took some medicine and the pain stopped.-

a. Koga će Zoran pitati da li će je  
who aux3PsFt Zoran asked comp part aux3PsFt her  
pregledati?  
examine  
(Who will Zoran ask if (she) will examine her?)

b. Za koga će Zoran pitati da li će je  
for whom aux3PsFt Zoran ask comp part her aux3PsFt  
pregledati?  
examine  
(Who will Zoran ask if (she) will examine her?)

Part B: Medial Wh

7.

Zoran i Vesna razgovaraju o tome šta će raditi na leto.

Zoran hoće da idu kod dede na selo.

Zoran kaže: "Pitaću tatu kada ćemo posetiti dedu."

- Ovo je njihova kuća na selu.-

Zoran and Vesna are talking about what they are going to do in summer.

Zoran wants to visit their grandpa in the country.

Zoran says: "I'll ask dad when we are going to visit grandpa."

- This is their house in the country.-

a. Koga će Zoran pitati kada će ga posetiti?  
who aux3PsFt Zoran ask when aux3PsFt him visit  
(Who will Zoran ask when (he/they) will visit him?)

b. Za koga će Zoran pitati kada će ga posetiti?  
for whom aux3PsFt Zoran ask when aux3PsFt him visit  
(Who will Zoran ask when (he/they) will visit him?)

8.

Deca imaju zadatak da nekoga nacrtaju.

Vesna hoće da nacrtaju baku, ali ne zna kako.

Vesna kaže: "Pitaću učiteljicu kako ću da nacrtam baku."

- Evo Vesne kako crta.-

Children have an assignment to sketch somebody.

Vesna wants to draw her grandma, but she does not know how.

Vesna says: "I'll ask the teacher how to draw grandma."

- Here is Vesna drawing.-

a. Koga će Vesna pitati kako će je nacrtati?  
who aux3PsFt Vesna ask how aux3PsFt her sketch  
(Who will Vesna ask how to draw her?)

b. Za koga će Vesna pitati kako će je nacrtati?  
for whom aux3PsFt Vesna ask how aux3PsFt her sketch  
(Who will Vesna ask how to draw her?)

9.

Mama je jutros bila na pijaci.

Tamo je sreła Zoranovu učiteljicu.

Kad je došla kuci, Zoran ju je pitao: "A gde si ti sreła moju učiteljicu?"

- I onda je odmah seo da radi domaci.-

Mom went to the market in the morning.

There she met Zoran's teacher.

When she came back, Zoran asked her: "Where did you meet my teacher?"

- And he sat down immediately to do his homework.-

a. Koga je Zoran pitao gde ju je sreła?  
who aux3PsPr Zoran asked where her aux3PsPr met  
(Who did Zoran ask where (she) had met her?)

b. Za koga je Zoran pitao gde ju je sreła?  
for whom aux3PsPr Zoran asked where her aux3PsPr met  
(Who did Zoran ask where (she) had met her?)

10.

Vesna je pomogla mami da skuvaju ručak.

Mama ju je poljubila.

Zoran je pitao mamu: "A zašto si ti poljubila Vesnu?"

- Evo porodice kako ruča.-

Vesna helped mom to make lunch.

Mom gave her a kiss.

Zoran asked mom: "Why did you kiss Vesna?"

- Here is the family having lunch.-

a. Koga je Zoran pitao zašto ju je poljubila?  
who aux3PsPr Zoran asked why her aux3PsPr kissed  
(Who did Zoran ask why (she) had kissed her?)

b. Za koga je Zoran pitao zašto ju je poljubila?  
for whom aux3PsPr Zoran asked why her aux3PsPr kissed  
(Who did Zoran ask why (she) had kissed her?)

11.

Zoran je napravio strašan nered u svojoj sobi i otišao je napolje da se igra.

Tata je jako ljut zbog toga. Kaze da će ga kazniti. Zoran se prepao. Vesna mu kaže: "Nemoj da se plašiš, pitaću ja tatu kako će te kazniti."

- Zoranu je zabranjeno da izađe da se igra sa drugarima.-

Zoran made a terrible mess in his room and went out to play. Dad is very angry. He says that he is going to punish him. Zoran is scared. Vesna tells him: "Do not be afraid, I'll ask dad how he will punish you."

- Zoran is forbidden to go out to play with his friends.-

a. Koga će Vesna pitati kako će ga kazniti?  
who aux3PsFt Vesna ask how aux3PsFt him punish  
(Who will Vesna ask how (he) will punish him?)

b. Za koga će Vesna pitati kako će ga kazniti?  
for whom aux3PsFt Vesna ask how aux3Psft him punish  
(Who will Vesna ask how (he) will punish him?)

12.

Vesna je sanjala kako su njene lutke oživele.

Ovo su njene najdraže lutke: Princeza i Barbika.

Barbika je gurnula Princezu na pod. Vesna ju je pitala: "Zašto si gurnula princezu?"

- Onda je naišla mama i probudila Vesnu.-

Vesna had a dream that her dolls became alive.

These are her most favourite dolls: Princess and Barbie.

Barbie pushed Princess on the floor. Vesna asked her: "Why did you push Princess?"

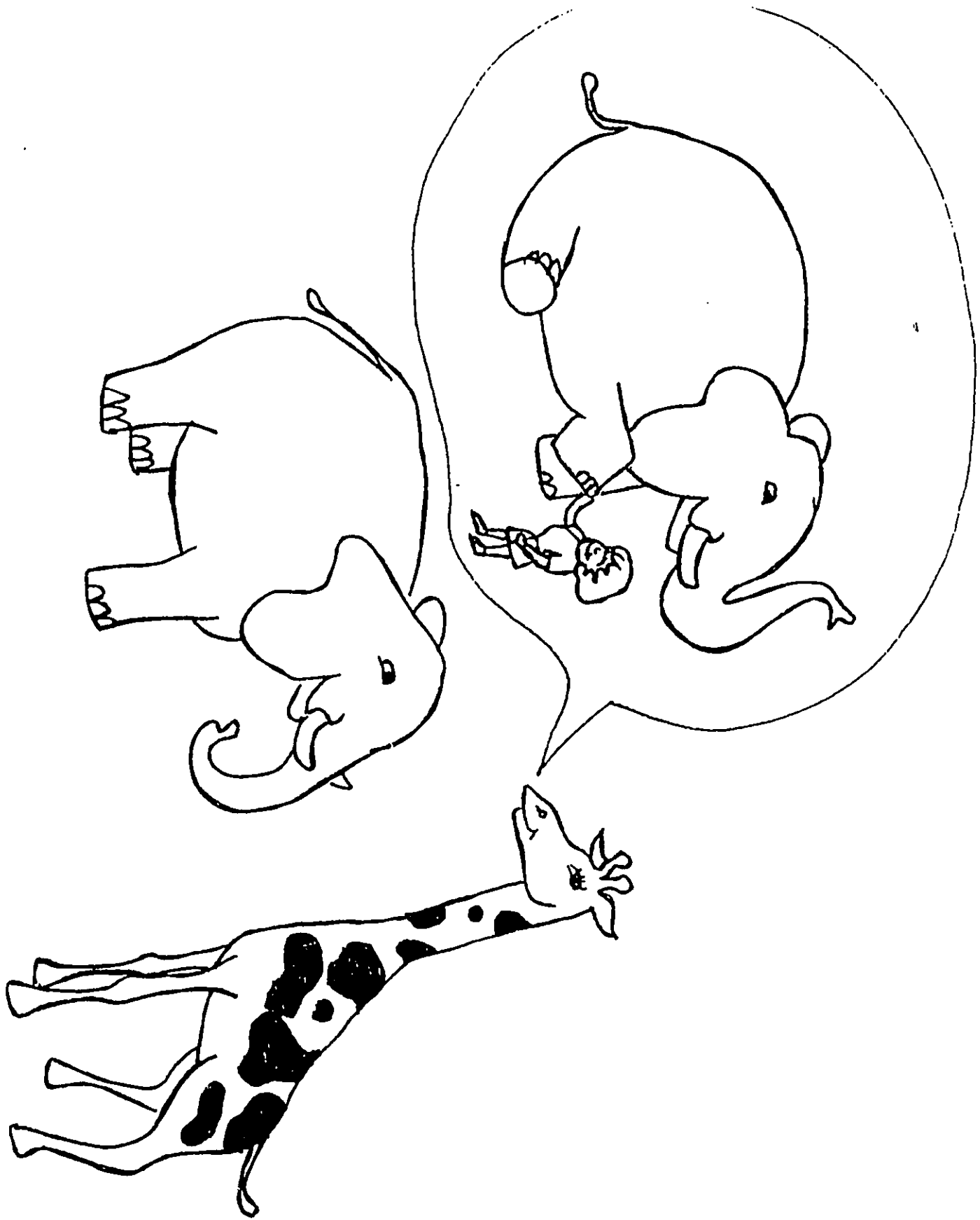
- Then mom came and woke Vesna up.-

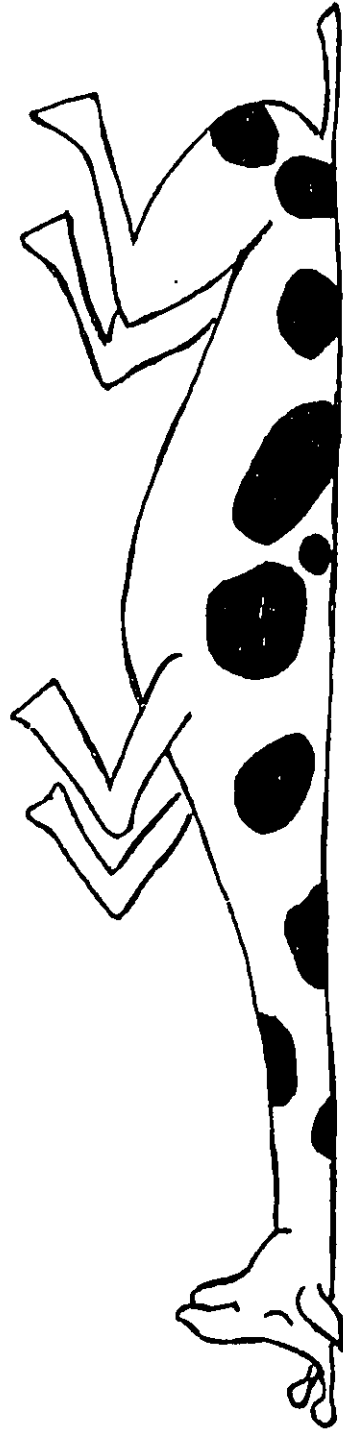
a. Koga je Vesna pitala zašto ju je gurnula?  
who aux3PsPr Vesna asked why her aux3PsPr pushed  
(Who did Vesna ask why (she) had pushed her?)

b. Za koga je Vesna pitala zašto ju je gurnula?  
for whom aux3PsPr Vesna asked why her aux3PsPr pushed  
(Who did Vesna ask why (she) had pushed her?)

APPENDIX 2  
Example of the pictures used to accompany the stories (no.5)







## Appendix 3

### Principle B Experiment

#### Version A

1. Saša hoće da ga Piter uštine.  
Sasa wants comp him Peter pinch  
(Sasa wants Peter to pinch him.)
2. Piter kaže da ga je Saša jurio.  
Peter says comp him aux3PsPr Sasa chased  
(Peter says that Sasa chased him.)
3. Meri kaže da ju je Sanja uštinula.  
Mary says comp her aux3PsPr Sanja pinched  
(Mary says that Sanja pinched her.)
4. Sanja hoće da se Meri iza nje sakrije.  
Sanja wants comp refl Mary prep her hide  
(Sanja wants Mary to hide behind her.)
5. Piter kaže da je Saša sa njim igrao.  
Peter says comp aux3PsPr Sasa prep him danced  
(Peter says that Sasa danced with him.)
6. Meri kaže da je Sanja na nju skočila.  
Mary says comp aux3PsPr Sanja prep her jumped  
(Mary says that Sanja jumped on her.)
7. Sanja kaže da se Meri uštinula.  
Sanja says comp refl Mary pinched  
(Sanja says that Mary pinched herself.)
8. Sasa kaže da se Piter ogrebao.  
Sasa says comp refl Peter scratched  
(Sasa says that Peter scratched himself.)
9. Piter hoće da se Saša umije.  
Peter wants comp refl Sasa wash  
(Peter wants Sasa to wash himself (his face).)

Version B

1. Sanja hoće da je Meri uštine.  
Sanja wants comp her Mary pinch  
(Sanja wants Mary to pinch her.)
2. Meri kaže da ju je Sanja jurila.  
Mary says comp her aux3PsPr Sanja chased  
(Mary says that Sanja chased her.)
3. Piter kaže da ga je Sasa uštino. <sup>o</sup>  
Peter says comp him aux3PsPr Sasa pinched  
(Peter says that Sasa pinched him.)
4. Sasa hoće da se Piter iza njega sakrije.  
Sasa wants comp refl Peter prep him hide  
(Sasa wants Peter to hide behind him.)
5. Meri kaže da je Sanja sa njom igrala.  
Mary says comp aux3PsPr Sanja prep her danced  
(Mary says that Sanja danced with her.)
6. Piter kaže da je Sasa na njega skočio.  
Peter says comp aux3PsPr Sasa prep him jumped  
(Peter says that Sasa jumped on him.)
7. Sasa kaže da se Piter uštino. <sup>o</sup>  
Sasa says comp refl Peter pinched  
(Sasa says that Peter pinched himself.)
8. Sanja kaže da se Meri ogrebala.  
Sanja says comp refl Mary scratched  
(Sanja says that Mary scratched herself.)
9. Meri hoće da se Sanja umije.  
Mary wants comp refl Sanja wash  
(Mary wants Sanja to wash herself (her face).)

## Appendix 4

The analyses of different conditions for 42 child subjects  
(split by age groups)

	TOP da li	TOP Wh	BOTTOM da li	BOTTOM Wh	OTHER da li	OTHER Wh	
Age							
4-year-old	1.86 62	2.00 67	0.64 21	0.36 12	0.58 19	0.68 23	mean percent
5-year-old	2.21 74	2.18 73	0.64 21	0.50 17	0.14 5	0.32 11	mean percent
6-year-old	2.21 74	2.32 77	0.50 17	0.50 17	0.28 9	0.18 6	mean percent
TOTAL	2.09 70	2.17 72	0.59 20	0.45 15	0.30 10	0.39 13	mean percent

Table 7.a. Mean score and percentages of top clause, bottom clause, and other responses: DA LI/WH

	TOP No ZA	TOP Yes ZA	BOTTOM No ZA	BOTTOM Yes ZA	OTHER No ZA	OTHER Yes ZA	
Age							
4-year-old	2.18 73	1.68 56	0.36 12	0.64 21	0.46 15	0.71 24	mean percent
5-year-old	2.36 79	2.03 68	0.50 17	0.64 21	0.14 5	0.32 11	mean percent
6-year-old	2.50 83	2.03 68	0.43 14	0.57 19	0.07 2	0.39 13	mean percent
TOTAL	2.34 78	1.91 64	0.43 14	0.62 21	0.23 8	0.48 16	mean percent

Table 8.a. Mean score and percentage of top clause, bottom clause, and other responses: +/- INITIAL ZA

	TOP da li	TOP Wh	BOTTOM da li	BOTTOM Wh	OTHER da li	OTHER Wh	
Age							
4-year-old	2.21 74	2.14 71	0.50 17	0.21 7	0.28 9	0.64 21	mean percent
5-year-old	2.36 79	2.36 79	0.64 21	0.36 12	0.00 0	0.28 9	mean percent
6-year-old	2.36 79	2.64 88	0.50 17	0.36 12	0.14 5	0.00 0	mean percent
TOTAL	2.30 77	2.38 79	0.55 18	0.30 10	0.14 5	0.31 10	mean percent

Table 9.a. Mean score and percentages of top clause, bottom clause, and other responses : KOGA & DA LI/WH

	TOP da li	TOP Wh	BOTTOM da li	BOTTOM Wh	OTHER da li	OTHER Wh	
Age							
4-year-old	1.50 50	1.86 62	0.78 26	0.50 17	0.71 24	0.71 24	mean percent
5-year-old	2.07 69	2.00 67	0.64 21	0.64 21	0.28 9	0.36 12	mean percent
6-year-old	2.07 69	2.00 67	0.50 17	0.64 21	0.43 14	0.36 12	mean percent
TOTAL	1.88 63	1.95 65	0.64 21	0.59 20	0.48 16	0.48 16	mean percent

Table 10.a. Mean score and percentages of top clause, bottom clause, and other responses : ZA & DA LI/WH

The analyses of different conditions for 38 child subjects  
(split by age groups)

Age	Top da li	Top Wh	Bottom da li	Bottom Wh	Other da li	Other Wh	
4-year-old	1.88	2.04	.58	.27	.54	.73	mean
	63	68	19	9	18	24	percent
5-year-old	2.23	2.15	.62	.50	.15	.35	mean
	74	72	20	16	5	12	percent
6-year-old	2.29	2.50	.37	.29	.33	.20	mean
	76	83	12	19	11	6	percent
Total	2.13	2.22	.53	.35	.34	.43	mean
	71	74	17	12	12	14	percent

Table 7.b Mean score and percentage of top clause, bottom clause, and other responses: DA LI/WH

Age	Top da li	Top Wh	Bottom da li	Bottom Wh	Other da li	Other Wh	
4-year-old	1.88	2.04	.58	.27	.54	.73	mean
	63	68	19	9	16	25	percent
5-year-old	2.23	2.15	.62	.50	.15	.35	mean
	74	72	21	17	5	12	percent
6-year-old	2.29	2.50	.37	.29	.33	.20	mean
	76	83	13	10	11	7	percent
Total	2.13	2.22	.53	.35	.34	.43	mean
	71	74	17	12	12	14	percent

Table 8.b Mean score and percentage of top clause, bottom clause, and other responses: +/- INITIAL ZA

Age	Top da li	Top Wh	Bottom da li	Bottom Wh	Other da li	Other Wh	
4-year-old	2.15	2.07	.54	.23	.30	.69	mean
	72	69	18	8	10	23	percent
5-year-old	2.30	2.30	.69	.38	.00	.30	mean
	76	76	23	13	0	10	percent
6-year-old	2.33	2.66	.50	.33	.16	.00	mean
	77	88	15	11	5	0	percent
Total	2.26	2.34	.58	.31	.16	.34	mean
	75	78	19	10	5	11	percent

Table 9.b Mean score and percentage of top clause, bottom clause, and other responses: KOGA & DA LI/WH

Age	Top da li	Top Wh	Bottom da li	Bottom Wh	Other da li	Other Wh	
4-year-old	1.61	2.00	.61	.30	.77	.77	mean
	54	66	20	10	26	26	percent
5-year-old	2.15	2.00	.54	.61	.30	.38	mean
	72	66	18	20	10	13	percent
6-year-old	2.50	2.33	.25	.25	.50	.42	mean
	83	77	8	8	16	14	percent
Total	2.00	2.10	.47	.39	.53	.53	mean
	66	70	16	13	17	17	percent

Table 10.b Mean score and percentage of top clause, bottom clause, and other responses: ZA & DA LI/WH

## Notes

- <sup>1</sup> An analysis of Subjacency (Freidin: 1978b) treats it as a condition on representations, restricting unbounded traces within certain domains. His reformulation of Subjacency Filter is:  
\* $[A \dots [B \dots c_i \dots] \dots]$  where A and B are bounding categories (NP, IP) and  $c_i$  is free in A.
- <sup>2</sup> Grimshaw (1986) shows that the parametric variation of bounding categories is of a rather limited significance, since it can account for Subjacency violation in the initial movement (the most embedded CP) only, and it was suggested that some alternative theories should be established.
- <sup>3</sup> Müller and Sterenfeld (1993) exclude adjunction (e.g. scrambling) to either VP or IP as a possible way to circumvent Subjacency, since it would violate their Principle of Unambiguous Binding. They adopt the theory developed by Cinque (1990) that VP and IP are not barriers in the first place. It remains to be seen whether this analysis will be given support in the general linguistic theory.
- <sup>4</sup> Another possible explanation for its obligatory presence might be the clitic-second position: clitics need the first element for support, if the complementizer could be deleted, there would be no overt element to block the clitics from climbing all the way up to the main clause second position, yielding a structure like: \*Milan ga joi se je čudi Jovan ponudio pozove., instead of the grammatical:  
Milan se čudi [<sub>CP</sub> da joi je Jovan ponudio [<sub>CP</sub> da ga pozove]].  
(Milan wonders that Jovan has offered her to call him.)
- <sup>5</sup> Rizzi claims that the reason why the Italian sentence 'Chi credi che verria?' (\*Who do you think that came?) causes no That-t effect is that the subject, governed by the inflection marked [+Pronominal] is moved to the postverbal position and then extracted. He assumes that the verbal inflection with the agreement (person and number) does not play the major role in the possibility of subject inversion. If it did, SC corresponding examples should be grammatical, given that SC Infl does bear the same agreement features as the Italian Infl.
- <sup>6</sup> For example, Lasnik and Saito (1992) analyse the ways in which languages avoid that-t effects:  $C^0$  is turned into a governor via the Agr in Comp; Extraction is replaced by a resumptive (Swedish); or

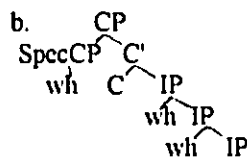
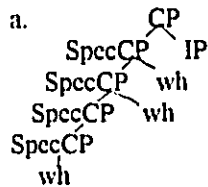
Extraction takes place from a properly governed position (Italian): none of these strategies seems to be applicable in SC, since *da* still blocks government.

7 All the SC speakers agree that the postverbal subject is the focus in the sentence, with the verbs that do not freely allow unstressed inversion (unlike the verbs such as 'happen, break out, appear...').

8 As soon as the subject is changes into *pro*/NP, the Croatian variant excludes the use of infinitive and goes for the *da*+subjunctive option.

9 If one adopted the idea that Subjacency violation (bounding nodes will have to be set for Serbo-Croatian) block extraction from within indicative clauses, the degree of ungrammaticality will result from the degree of violation, eg. subject extraction would violate Subjacency and ECP, while object extraction violates Subjacency only.

10 Rudin proposes the following tree representation to account for the different properties Bulgarian (a.) versus Serbo-Croatian (b.) Multiple Wh-fronting.



11 The presence of a pronoun in 32.a. and 33.a. will still yield ungrammatical structures.

12 The same holds for Slovenian, that I will assume henceforth to pattern with Serbo-Croatian regarding the issues discussed.

13 In one of the theories of control (Koster:1978) it has even been proposed that PRO has only the feature [+anaphor].

14 Lexical restrictions for Za+Wh structures would disallow them with a great number of verbs in the main clause, as illustrated in the following example: \*Za koga<sub>i</sub> je videla da e<sub>i</sub> je došao? Who<sub>i</sub> did she see t<sub>i</sub>

has come? Only about 15 verbs, among them verbs such as 'misliti, reci, pitati...' (think, say, ask...) can take *za koga* questions.

<sup>15</sup>As noted by Montalbetti (1984), the interpretation of empty categories need not be the same as the interpretation of overt categories with the same features, i.e. overt NP and pro show different behavior with respect to the Binding theory. Montalbetti's condition governing the distribution between overt and empty categories, the Overt Pronoun Constraint, is applicable in pro-drop languages only. It states that the overt pronouns cannot be bound when they are in contrastive distribution with their non-overt counterparts. It has to be stated, however, that Montalbetti restricts this condition to sentences in which main clause subject position is occupied by quantifier expressions only, but leaves open the possibility that pragmatics will have a strong biasing effect on the reading of sentences like 46, if no coreferential reading with the main clause subject is intended. The Serbo-Croatian speakers all agree that coreference between main clause subject, no matter what category, and the subordinate clause lexically filled subject is extremely unacceptable, on the verge of being ungrammatical.

<sup>16</sup> This is not contradictory to Montalbetti's proposal, which concerns changing binding possibilities for overt pronouns in specific environments, not for pro.

<sup>17</sup> A learning principle that would require 'one form-one function' distribution might lead the learner to incorporate this additional level into his grammar, since the nondistinguishable LF and S-Structure can no more account for different rules of grammar at this stage of acquisition.

<sup>18</sup> Of related interest to our study is the acquisition of Wh-movement in relative clauses. Labelle (1990), using an elicitation task, tested children's sensitivity to Wh-movement in French relative clauses. Children from three to six years of age failed to use Wh-movement in relative clauses, even though questions are formed by Wh-movement in their speech. The absence of pied-piping, and the presence of resumptives have led her to conclude that children do not use movement, but rather a rule of predication in forming relative clauses. It should be noted that, even though standard adult French does not allow resumptives (which are often found in substandard dialects, see Zribi-Hertz:1984), their presence in children's relative clauses should be interpreted as neutral with respect to the trace of movement. Relative clauses in many languages include overt resumptives (see Borer:1984 for Hebrew; and Browne:1986 and

Goodluck:1992 for Serbo-Croatian). Since some languages allow missing argument strategy (Shlonsky:1992 for Palestinian and Hebrew), additional criteria need to be established to confirm the absence of Wh-movement in child grammar of relative clauses. Island constraint violations, one of the most reliable criteria for establishing the existence of movement, were not given any consideration in the study.

An experiment designed to test the acquisition of relative clauses in Serbo-Croatian should elicit both simple relative clauses, as well as those in which Wh-islands are present. The existence of a system of dual relativization in Serbo-Croatian, i.e. movement and non-movement, has created a possibility to use all the criteria available (resumptive pronouns, pied-piping, and island constraints) to establish the initial strategy in child grammar. The data from this experiment will be compared to the results from a test of knowledge of Long Distance Binding in questions, to help us either confirm or refute claims about children's knowledge of movement rules in Serbo-Croatian.

19 Native speakers' judgment about the grammaticality of e.g. *za+ gde, kada, kako* etc. (*za+*'where, when, how') are almost identical in judging them ungrammatical, or highly unacceptable.

20 It does not obey the same constraints as other clitics, e.g. it can be topicalized, as in: *To sam joj već odavno ispričao.* (That I have told her a long time ago.)

21 Browne (1986) discusses this phenomenon, which he calls 'GA animacy'. It is possible, but only in relative clauses formed by operator-movement, to have the pronoun *ga* ('him') linked to an NP marked [+animate]. This is, however, not possible in the *Za+Wh* questions.

22 Certain dialects avoid this problem by using *za+ćega*, the declined form (genitive case), instead of *za+šta*, but this is excluded for two reasons: it is a substandard, ungrammatical variant; even though the preposition *za* can also assign the genitive case in Serbo-Croatian, it is disallowed in these environments, where accusative has to be assigned.

23 The subjunctive condition was excluded to rule out the responses that would be hard to interpret. Namely, if children gave bottom clause readings to *Za+Wh* structures, one could still not claim that they know the grammar of LDB. Their responses may as well be due to the fact that extraction is allowed out of subjunctive complements, and the resumptive was replacing the Wh-trace in these cases in their grammar.

24 Additional restriction is that only direct object position (marked accusative) be tested, since e.g. the pronoun in the indirect object position would be marked dative by the verb, whereas Za marks Koga accusative, and this possible clash of case markings has to be eliminated as well.

25 Clark referred to linguistic studies (e.g. Katz:1964; Postal:1970) in which only a few items (e.g. words like 'good, remind') were analyzed as if they comprised the whole body of interest, and suggested that the same method may be used in psycholinguistic research if the set of data is restricted.

26 The question that arose during the study is the c-command relation that does not hold between the surface position of the pronominal clitic and its antecedent, and the extent to which clitic-second restrictions affect binding possibilities. This question will be addressed in the concluding chapter.

27 I have adopted in the study the Principle B analysis for the grammar of Za+Wh structures. It may as well be that some other more complex rules govern the formation of these structures and that their complexity accounts for children's poor performance.

28 The lack of the knowledge that this is an optionally transitive verb would produce totally different results, but by giving top responses, as well as other responses children proved that they know these subcategorization features.

29 One of the youngest subjects tested was a four-year-old girl who gave 100% correct responses. This indicates that age does not play the major role in late emergence of these structures, but that lack of sufficient input can be one of the 'culprits'. A rather unpopular, but not implausible idea, is that some sociolinguistic factors may also be at work here (such as social class, parents' education, etc.).

30 The Subjacency analysis of the subjunctive/indicative distinctions can account for the theory of movement rules, but is still not adequate enough to account for the licensing of negative and positive polarity items.

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