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**INTONATION, WORD ORDER, AND FOCUS PROJECTION IN
SERBO-CROATIAN**

DISSERTATION

Presented in Partial Fulfillment of the Requirements for
the Degree Doctor of Philosophy in the Graduate
School of the Ohio State University

By

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The Ohio State University
2000

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ABSTRACT

It is well established in the literature that focus and prosodic prominence are related. However, the nature of this relationship is still under debate. The standard assumption (Selkirk, 1984, 1995; Rochemont, 1986, 1998, among many others) is that this relationship, also known as focus projection, is syntactically constrained. However, this assumption has not gone unchallenged (Schwarzschild, 1999; Chapman, 1998; Kadmon, 2000). In this thesis I present Serbo-Croatian data that bear on the focus-prominence relation. By integrating a detailed intonational study with syntactic and semantic analyses, the picture that emerges of the focus system in Serbo-Croatian is one in which prosodic cues and word order provide separate but related cues for indicating focus. I show that these two types of focus marking (prosodic vs. positional), although complementary in many ways, can be unified by the same set of constraints on focus projection. This set of constraints is a modified version of the Selkirk/Rochemont style Focus Projection Algorithm. The constraints include sensitivity to argument structure, semantic type of focus exponent, and word order. This result then argues in favor of a syntactically constrained relationship between focus marking and focus. In particular, using the notion of syntactic constituency seems to be the most parsimonious way to account for constraints governing word order. If this conclusion is accepted it also has consequences for the syntactic representation of scrambling.

One of the main claims of the thesis is that focus projection in a language that has a positional focus is sensitive to argument structure. This is surprising given that most research on other languages with a positional focus (Kiss, 1995; Zubizarreta, 1998; Kidwai, 2000) imply absence of this constraint.

To the fond memory of the family that raised me not knowing WHAT to expect:

my mother Jelena 1941–1965

my grandmother Ljubica 1910–1979

my grandfather Dimitrije 1910–1993

my uncle Sava 1941–1996

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San Diego,
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CHAPTER 1

INTRODUCTION

1.1 The Big Picture

This work is a study of focus projection in Serbo-Croatian. Serbo-Croatian is a South-Slavic language spoken in the former Yugoslavia, now consisting of three separate countries: Croatia, Yugoslavia (Serbia and Montenegro), and Bosnia and Herzegovina. My study is based on data exclusively from the Serbian part of these three territories. However, I believe that many points, especially the syntax, carry over to the varieties spoken in other regions as well.

Focus projection is a phenomenon extensively discussed for languages such as English, German, and Dutch, where focus is signalled by prosodic means, i.e., the nuclear pitch accent.¹ Focus is assumed to be marked by the feature [F] in the syntax. The element carrying a pitch accent realizes the [F] feature in the syntax and is also known as the focus exponent (von Stechow and Uhmann, 1986). The relationship between the focus exponent and the focus (or the focus domain) is not one-to-one. This is true in the sense that the focus domain often corresponds to a larger syntactic constituent than the word

¹The nuclear pitch accent is a type of prosodic prominence, more specifically, a pitch perturbation associated with the syllable in a sentence that bears nuclear stress.

containing the syllable with the nuclear accent. This non-isomorphic mapping between the focus exponent and the focus domain is what we refer to as “focus projection”. The focus marked by the accent “projects” onto a morphosyntactic constituent of potentially variable size. One empirical consequence of focus projection is focus ambiguity. That is, a single utterance is many ways ambiguous as to which focus domain is signalled, since the utterance is compatible with a number of possibilities.

The fundamental question that many researchers on focus have been addressing for the past several decades is whether the relationship between focus and prosodic prominence is a part of grammar. For some the answer to this question is no (Bolinger, 1972, 1986; Chapman, 1998). For others the answer is indisputably affirmative. However, among those who assume that the focus–prominence relation is part of grammar, the question about the relationship between focus and prosodic prominence is transformed into a question about which part of grammar is responsible for constraining this relationship. For some researchers this relationship is constrained by syntax. The syntactic constraints on focus projection for English, German, and Dutch are formulated in the form of a Focus Projection Algorithm (see Selkirk, 1984; Gussenhoven, 1983; Rochemont, 1986; von Stechow and Uhmann, 1986, and references therein). For others, this relationship is regulated by pragmatics (Schwarzschild, 1999; Kadmon, 2000).

It is also often claimed that in some languages (Catalan (Vallduví, 1992), Hindi (Kidwai, 2000), Hungarian, some Bantu languages (Hyman and Watters, 1984), etc.) the primary means of signalling focus is not prosodic but rather syntactic, i.e., word order. These are languages for which word order is claimed to be constrained pragmatically rather than syntactically. The freedom of word order in Slavic languages, such as Czech, Russian,

Serbo-Croatian, Bulgarian etc. is claimed to be of the same type. One of the implicit assumptions in these claims is that in these languages the primary means for signalling focus is not prosodic but syntactic (positional).

Given that there seem to be at least two types of focus marking among languages, prosodic and syntactic, and given that the study of focus projection has been done only on languages that mark focus by pitch accent, the research question that this thesis addresses directly is the following: **Does Focus Projection depend on the type of focus marking?** This question is appropriate both for the comparison of languages that mark focus prosodically versus those that mark focus positionally, and for the comparison of those languages that mark focus prosodically but which use different types of prosodic cues to mark focus.

In this thesis I investigate the relationship between prosodic prominence and word order in Serbo-Croatian and show that Serbo-Croatian has two means of signalling focus: (i) by position (syntactic, i.e. word order) and (ii) by prosodic distinction, (prosodic prominence) which is different from English. These two means of signalling focus are related, but in some respects complementary. I further show that both of these strategies of marking focus are governed by the same set of rules. More specifically, the rules are mediated through syntax. This result then argues that focus projection is not necessarily dependent on the type of focus marking.

1.2 The Basic Issues

In this section I briefly illustrate the basic issues this dissertation is concerned with. There are three sets of issues: focus marking; focus identification, and the relationship between these two, which we call focus projection.

1.2.1 Focus Marking and Focus Identification

I will first illustrate these concepts in English. Prosodic prominence is marked by capitalization. Consider the following example.

(1) Helen is buying RASPBERRIES.

The example in (1) is a sentence of English where the nuclear accent is on the first syllable of *raspberries*, marked by small caps. The nuclear pitch accent is a focus marker. What is the focus of this utterance and how can we tell? This utterance is ambiguous as to what the focus is. The focus can be *raspberries*, or *is buying raspberries*, or *Helen is buying raspberries*. The identification of the intended focus (i.e. focus domain) of this utterance can only be done in a context. Out of context, it is impossible to say with more precision than just to list the three possibilities just mentioned.

How do we know that only these three possibilities are viable and nothing else? That is, why can't we say that the focus is *Helen ... raspberries*? We know that only these three alternatives are justified because an utterance of (1) with a single nuclear accent on *raspberries* can only function in a discourse in which it is an answer to one of these three questions:

- (2) a. What is Helen buying?
 b. What is Helen doing?
 c. What's happening?

In other words, focus of a sentence is that portion of a sentence that is the answer to a *wh*-question. We know that *Helen ... raspberries* can't be the focus because (1) cannot felicitously be used to answer the question *Who bought what?* This is the working definition of focus that I will adopt for the purpose of the investigation of focus in this thesis. Thus, *wh*-questions are the best probe for focus. We can identify the focus of a sentence if we know which *wh*-question it is being used to answer. Some times, questions are explicit and focus identification is transparent. However, a lot of times questions are not explicit, and part of understanding the discourse we are engaged in involves calculating a possible relevant question that an utterance may be an answer to, given the context in which it occurs. This is not a conscious process, it is part of knowing the language and its communicative value in different contexts.

1.2.2 Focus Projection

We have seen that an utterance of (1) is compatible with three different types of questions. That is, it can be used in three different contexts, in each of which the focus domain is different. We will use subscript "F" to mark the focus domain. Thus, the three possible foci of (1) can be represented as in (3), (4) and (5).

- (3) a. What is Helen buying?
 b. Helen is buying _F[RASPBERRIES].

- (4) a. What is Helen doing?
 b. Helen is F [buying RASPBERRIES].
- (5) a. What is happening?
 b. F [Helen is buying RASPBERRIES].

In (3), the focus corresponds to the direct object NP, *raspberries*. In (4), the focus corresponds to the syntactic VP, *is buying raspberries*; and in (5), the focus corresponds to the whole sentence, *Helen is buying raspberries*. When the focus domain encompasses the whole sentence we call this type of focus domain "broad focus". When the focus domain encompasses only the word that contains the prominent syllable we call this "narrow focus". These terms are relational and their origin and use will be discussed in Chapter 2. The key issue here is that the same accent placement is compatible with more than one focus domain. We say that the focus exponent is able to "project" focus to other constituents that contain it. As we will see in Chapter 2, the ability of the focus exponent to project focus in different ways is directly related to the syntactic and semantic relationship between it and the other constituents within the focus domain.

1.2.3 The Basic Issues of Focus Projection in Serbo-Croatian

The Serbo-Croatian equivalent of (1) is (6). Under neutral intonation this sentence is ambiguous with respect to focus in the same way the English example is. This would suggest that Serbo-Croatian focus projection may work the same way English does.

- (6) Jelena kupuje maline.
Jelena.NOM buying raspberries.ACC.
'Jelena is buying raspberries.'

However, Serbo-Croatian raises additional issues, given that Serbo-Croatian is a relatively free constituent-order language. The propositional content of (6) could be expressed by a sentence with any of the logically possible constituent orders among the subject, the verb, and the object. That is, any of the members of the set $W: \{ SVO, SOV, VOS, VSO, OVS, OSV \}$ should do. However, with respect to focus domain, not all of these logically possible alternatives of word order are ambiguous with respect to focus and consequently they do not have the same focus signalling potential.

Before we look at other possibilities that are available to express the meaning of the utterance in (6), we will make two distinctions about the prosody of a Serbo-Croatian utterance. First, a Serbo-Croatian sentence can be uttered with neutral prosody. Neutral prosody means that the sentential stress is rightmost, or on the last phonological word in the intonational phrase. Second, a Serbo-Croatian sentence can be uttered with marked (or emotive) prosody, which means that sentential stress is not on the last phonological word in the intonational phrase.

Now, consider the following possibilities. If a sentence were to be uttered with neutral prosody I will not mark the sentential stress. If it were to be uttered with marked prosody, I will indicate the sentential stress by capitalization of the word that bears it.

- (7) SVO patterns
a. Jelena kupuje maline.

- b. JELENA kupuje maline.
 - c. Jelena KUPUJE maline.
- (8) **VOS patterns**
- a. Kupuje maline Jelena.
 - b. KUPUJE maline Jelena.
 - c. Kupuje MALINE Jelena.
- (9) **VSO patterns**
- a. Kupuje Jelena maline.
 - b. KUPUJE Jelena maline.
 - c. Kupuje JELENA maline.
- (10) **OVS patterns**
- a. Maline kupuje Jelena.
 - b. MALINE kupuje Jelena.
 - c. Maline KUPUJE Jelena.
- (11) **OSV patterns**
- a. Maline Jelena kupuje.
 - b. MALINE Jelena kupuje.
 - c. Maline JELENA kupuje.

Not all of these orderings are felicitous in the same contexts. Some of them overlap in their contextual appropriateness and some don't. Among the research questions that this thesis addresses are the following: (i) How do we explain the interaction between constituent order, prosodic prominence, and felicity in a given context? (ii) What are the focus projection potentials of these different word orders and how do they relate to their syntactic structure and their prosodic structure? As a background to answering these questions I will provide an analysis of Serbo-Croatian prosodic structure (chapter 3) and Serbo-Croatian syntactic structure (chapter 4). I will directly tackle the above questions in chapter 5.

1.3 Organization of the Thesis

This thesis is organized into four main parts. Chapter 2, introduces the basic issues of focus, focus marking, and focus identification. It motivates the distinction between focus marking and focus, and discusses the relationship between the two and the ways in which it has been accounted for in the previous literature.

Chapter 3, presents the basic overview of Serbo-Croatian intonation and provides an analysis and a finite-state grammar of the intonational system. I argue for two levels of prosodic phrasing: the phonological word and the intonational phrase. The phonological word is the domain of the lexical pitch accent and the word boundary tone, whereas the intonational phrase is the domain of the phrase accent. I show that there are two basic intonational patterns, traditionally referred to as "neutral" and "emotive". The main difference

between the two patterns is in the placement of the phrase accent. The neutral intonation pattern allows only the phrase accent placement on the right-most phonological word, whereas the emotive intonation pattern is characterized by early phrase accent placement.

Chapter 4 introduces the basics of Serbo-Croatian syntax. I show that despite the free word order which may lead one to assume a non-configurational structure, according to the standard constituency tests Serbo-Croatian can be shown to be configurational. The variation in constituent ordering is treated as a movement operation out of the basic, underlying structure. I show that, based on the various tests, most positions occupied by the moved constituents have both A and A' (argument vs. non-argument) properties. Only the VP adjoined position consistently shows A properties. This result is then applied in chapter 5 to support the proposal for base generating different orderings of internal arguments within the VP.

Chapter 5 provides an analysis of the interaction of intonation and word order in signaling focus. I argue that the focus projection algorithm relevant for Serbo-Croatian is sensitive to three constraints: (i) argument structure, (ii) semantic type of the word which is the focus exponent, and (iii) word order. I incorporate the first two constraints into the Selkirk/Rochemont style focus projection algorithm and I use the third constraint on focus projection as an argument for deriving certain word orders by means of VP-movement, rather than as an instance of multiple scrambling. To my knowledge, the fact that focus projection in a language with a positional focus is sensitive to argument structure has not been documented before. Thus, this presents the main result of this thesis.

Chapter 6 summarizes the findings in these four major parts and comments on the need for further research.

CHAPTER 2

FOCUS – THEORETICAL BACKGROUND

2.1 Introduction

The term 'focus' is often used to denote one of three different concepts: (i) a phonologically prominent constituent (Pierrehumbert and Beckman, 1988; Jackendoff, 1972; Gussenhoven, 1984; Selkirk, 1984, 1995; Rochemont, 1986, 1998; Vallduví, 1992; Vallduví and Engdahl, 1996b; Rooth, 1995; Roberts, 1996; Schwarzschild, 1999; Jun, 1996); (ii) a semantic interpretation of the prominent constituent as the most informative part of a sentence in a context, i.e. the focus of a sentence (Jackendoff, 1972; Culicover and Rochemont, 1983; Gussenhoven, 1984; Selkirk, 1984, 1995; Rochemont, 1986, 1998; Vallduví, 1992; Vallduví and Engdahl, 1996b; Rooth, 1995; Roberts, 1996; Schwarzschild, 1999, among many others); and (iii) a non-linguistic notion of semantic/pragmatic salience or discourse prominence used in computational linguistics and artificial intelligence, such as the work in Centering theory, e.g. the focus stack of Grosz and Sidner (1986).

The concept of focus referred to in (iii) is diametrically opposed to the linguistic notions of focus in (ii) and (i). In many respects it is closer to the notion of topic rather than focus. However, even though I am assuming that a comprehensive theory of pragmatics includes ideas central to the Centering theory, I will not adopt Centering theory usage in this respect,

and I will only be concerned with the term focus used as a linguistic notion mentioned in (i) and (ii).

Because the linguistic term 'focus' is also used in two different ways, in this thesis I will keep them separate. I reserve the term 'focus' only for the sense (ii), that is, by the term focus I will only refer to a semantic constituent, i.e., the denotation of the syntactic constituent corresponding to the prominent constituent. For the phonological notion of focus, I will only use the terms 'prosodic prominence' (or sometimes just 'prominence'). For the element carrying the phonological prominence, I will use the term "focus exponent". For the syntactic constituent whose denotation is the focus I will use the term 'focus domain'.

Utterances gain their pragmatic effectiveness in part through their semantic focus. Focus directs the interpretation of an utterance to a relevant set of alternatives by directing attention of the interlocutor to the instructive part of the utterance. Thus, focus is a part of a range of strategies language users have at their disposal for guiding the interlocutor to the right set of assumptions desired to be shared. Among other strategies that are part of this group are pronominalization, *pro*-drop, use of epithets and titles, for signalling coreference; and ellipsis of different kinds, for signalling semantic identity (see Gundel et al., 1993; Kameyama, 1999; Ladd, 1996; Merchant, 1999; Williams, 1997, and references therein).

It is well established in the works already cited that focus and prosodic prominence are related. Yet, the nature of this relationship is still under debate. The standard assumption (Selkirk, 1984, 1995; Rochemont, 1986, 1998, among many others) is that this relationship is syntactically constrained. However, this assumption has not gone unchallenged (Schwartzschild, 1999; Chapman, 1998; Kadmon, 2000, among others). In this thesis I will present data from a scrambling language and show that using the notion of syntactic

constituency seems to be the most parsimonious way to account for the prominence–focus relationship. If this conclusion is accepted it also has consequences for the syntax of scrambling.

This chapter is organized as follows. In section 2, I present different types of phonological means for signalling prominence that are relevant for focus; in section 3, I present my assumptions about the focus–prominence relation; in section 4, I introduce constraints on the focus–prominence relation; in section 5, I discuss how the focus of a sentence is identified; and in section 6 I consider the influence of context on prominence placement (i.e., deaccenting). The main conclusion is that prominence and context together guide the focus identification, and neither alone is sufficient to identify focus.

2.2 Types of Prosodic Prominence

Focus can be signalled by different means: phonological, morphological, or syntactic. Each of these means has to do with prominence at that level: phonology, morphology, or syntax, respectively. In many languages focus has been tied to phonological marking. However, there are languages which seem to employ only other means of signalling focus. Morphological marking of focus is claimed for Navajo (Vallduví and Engdahl (1996b) citing Schauber (1978)), and a number of Bantu languages (Watters, 1979; Odden, 1984; Hyman and Watters, 1984). Syntactic marking of focus is claimed for Catalan (Vallduví, 1992; Vallduví and Engdahl, 1996a,b), but also English (Rochemont, 1986; Rochemont and Culicover, 1990; Rochemont, 1998), Spanish (Zubizarreta, 1998), Hungarian (Horvath, 1986)

(although see Roberts (1998) for a different analysis), Hindi (Kidwai, 2000), etc. However, as we know from English, which seems to use both phonological and syntactic means (e.g. cleft and pseudo-cleft construction) of signalling focus, it is not clear that morphological and syntactic signalling of focus are entirely independent of phonological marking of focus. It is possible that a more thorough investigation of intonation patterns of these languages which are claimed to employ exclusively morphological or syntactic marking of focus will show that phonological marking is also present. In any case, I will not have anything to say about alleged cases of morphological marking of prominence.

For languages for which it is claimed to mark focus phonologically, the phonological marking is not necessarily of the same type. That is, there are different prosodic means for marking focus. It is important to emphasize this difference in prosodic marking of focus because the research on focus projection has been extensively done only on languages that mark focus by pitch accent. In chapter 3, I will show that Serbo-Croatian does not use pitch accent as a phonological marker of focus and will thus establish that a study of focus projection in Serbo-Croatian is a good candidate for determining whether focus projection is dependent on the type of a focus marker. In this section I introduce three types of phonological marking of focus: pitch accent placement, phonological phrasing, and pitch range expansion.

2.2.1 Focus Marking by Pitch-accent

In English, German, Dutch, and some other Germanic languages that have postlexical pitch accents, a phonological correlate of focus is the placement of the nuclear pitch accent (Halliday, 1967; Bolinger, 1978; Ladd, 1980; Pierrehumbert, 1980; Selkirk, 1984; Gussenhoven,

1983, inter alia). In the focus literature the focus-signalling property of pitch accent is most often taken to be a property of morphosyntactic words. Words that bear the nuclear pitch accent can be interpreted as focused. However, pitch accents are also able to signal prominence of constituents smaller and larger than words. Pitch accent marking of constituents larger than words is known as 'focus projection', and is discussed in section 2.3.

The use of pitch accent to mark units smaller than words, such as bound morphemes, as prominent can be found in corrective uses such as in (12). The presence of a pitch accent is indicated by capitalization.

(12) Bolinger (1986)

This whiskey wasn't **EX**ported from Ireland, it was **DE**ported.

The use of nuclear pitch accent to mark word-units as prominent can be illustrated by the following examples:

(13) a. Mary bought a **NEW** monitor.

b. **MARY** bought a new monitor.

The presence of the pitch accent on the words marked by capitalization can be seen in pitch tracks in figures 2.1 and 2.2. The portion of the pitch track corresponding to the pitch perturbations, i.e., the rise in the fundamental frequency (F_0), aligns with what we hear as the pitch accent. In figure 2.1, we see the rise in F_0 at the beginning of the utterance around the first syllable of *Mary*, and in figure 2.2, the F_0 rise occurs around the word *new*.

In each of the examples in (13), in certain contexts the pitch accent can be interpreted as signaling focus of the word bearing the accent. These cases are referred to as **narrow focus**.

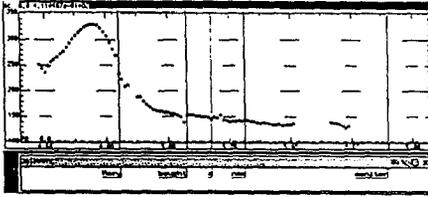


Figure 2.1: An F_0 track of the sentence *MARY* bought a new monitor.

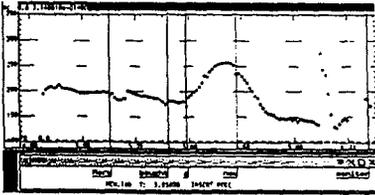


Figure 2.2: An F_0 track of the sentence *Mary* bought a *NEW* monitor.

The focus is narrow because it is confined to the word containing the accent. Examples of this type are used as evidence that there is a bidirectional relationship between focus and accent. The main idea of this view is that focus and accent coincide on the same word. The most prominent proponent of this idea was Bolinger. However, in section 2.3 we will see that this idea is untenable.

2.2.2 Focus Marking via Prosodic Phrasing

A number of languages are known to manipulate prosodic phrasing as a means of signalling focus. Among them are Japanese (Pierrehumbert and Beckman, 1988), Chicheŵa (Kanerva, 1989), Bengali (Hayes and Lahiri, 1991), Korean (Jun, 1996), Shanghai Chinese (Jin, 1986; Selkirk and Shen, 1990). These are all languages in which some prosodic constituent below the intonational phrase, identified reliably enough by tone and/or segmental distinctions, is used to signal focus. These languages show that phrasing can also be manipulated for the purpose of signalling focus.

Depending on the language, the non-default phrasing inserts an unexpected boundary before or after the focused word and deletes subsequent boundaries. The following is a simplified classification of narrow focus effects on prosodic phrasing: (a) deletion of prosodic boundaries after the focus (also known as dephrasing: Korean, Japanese), (b) addition of a prosodic boundary at the left edge of focus (Korean, Japanese), (c) addition of a prosodic boundary at the right edge of focus (Chicheŵa, Bengali). This classification of focus effects is paradigmatic. It is arrived at by comparing two types of utterances: those with broad (also known as "neutral") focus and those with narrow focus on a particular word. Simplifying a little bit, broad focus is focus that corresponds to the entire sentence, whereas narrow focus corresponds only to the word that bears the prominence. We will define these terms more precisely in the next section. Thus we speak of a deletion or an addition of a prosodic boundary for the purpose of signalling narrow focus in comparison to a broad (neutral) focus utterance of the same text.

Here are some examples of how focus affects prosodic phrasing in Korean. The curly brackets indicate phonological phrases relevant for focus marking (i.e., accentual phrases of Jun (1996)), square brackets indicate the sentential syntactic boundaries (i.e., IP boundaries), and the “%” sign marks the intonational phrase boundaries.

(14) Korean from Jun (1996)

- a. kjəurc tʃɛbchan oiga masit'anintc, tʃəŋmal kilə-ntc
 winter.LOC to.grow.REL cucumber.NOM delicious-but really so-Q
 'Is it true that a cucumber grown in winter is delicious?'

b. broad (neutral) focus

[[kjəurc dʒɛbchan] {oiga} {masit'anintc}]_{IP} % [[tʃəŋmal kilə-n tc]]_{IP} %

c. adjunct within relative focused

[[kjəurc dʒɛbchan oiga masit'anintc]]_{IP} % [[tʃəŋmal kilə-ntc]]_{IP} %

d. verb within relative focused

[[kjəurc] {tʃɛbchan oiga masit'anintc}]_{IP} % [[tʃəŋmal kilə-n tc]]_{IP} %

e. the head noun focused

[[kjəurc dʒɛbchan] {oiga masit'anintc}]_{IP} % [[tʃəŋmal kilə-n tc]]_{IP} %

f. main predicate is focused

[[kjəurc dʒɛbchan] {oiga} {**masit'anintc**}]_{IP} % [[tʃəŋmal kilə-n tc]]_{IP} %

The prosodic prominence in (14) is indicated by bold face. This sentence is syntactically complex. It is a conjunction of two separate sentences, where the second conjunct is a

question and the first conjunct is a declarative sentence serving as a background for the question. We are interested in the focus marking expressed in the declarative sentence within the first conjunct.

When this sentence is in neutral (i.e., broad) focus, it has three phonological phrases. However, when the focus is on the first word, there is only one phonological phrase. Each focused word starts a new phonological phrase and deletes all subsequent prosodic boundaries up to the end of the intonational phrase. The phonological phrasing shown in (14) is reflected in the pitch contour of an utterance. The pitch tracks of representative productions of these sentences are provided in Figures 2.3–2.7.

Since the question in the second conjunct is a yes-no question pertaining to the proposition expressed in the first conjunct, the focus within the first conjunct serves as the focus of the question. Thus, when the focus is on the adjunct, *kjəure* ‘winter’, within the relative clause in the subject of the first conjunct, the question that is being asked is whether cucumbers grown in winter as opposed to other seasons are delicious. The interpretation of other narrowly focused questions works similarly.

The Korean examples illustrate how prominence related to focus affects phonological phrasing: in Korean a focused constituent must begin a phonological phrase.

2.2.3 Focus Marking via Pitch Range Expansion

In many languages, especially in those that are based on lexical tone, some varieties of Chinese for example, pitch accents are not even part of their grammatical ontology. In these languages, prosodic prominence is instead conveyed by manipulation of the local pitch range.

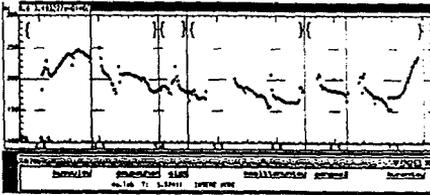


Figure 2.3: Neutral focus: 'Is it true that a cucumber grown in winter is delicious.' The prosodic phrasing is indicated by curly brackets in the top part of the panel. Vertical lines mark the ends of the words. In neutral focus, the utterance corresponding to the first conjunct consists of three accentual phrases.

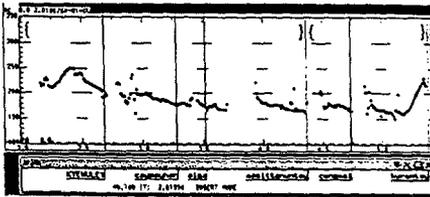


Figure 2.4: Focus in on the adjunct within the relative clause. 'Is it true that a cucumber grown in WINTER is delicious.' The prosodic phrasing is indicated by curly brackets in the top part of the panel. Vertical lines mark the ends of the words and capitalization marks the focused word. When the focus is on the first word, there are two intonational phrases. As shown by the prosodic phrasing-at the top of the panel and as the pitch track indicates, focus on the first word deletes subsequent prosodic structure, as compared to the prosodic phrasing of the same sentence under neutral focus in figure 2.3.

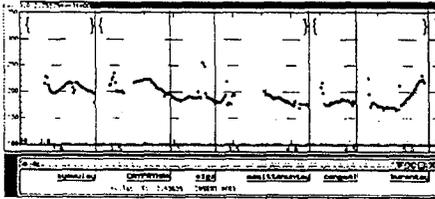


Figure 2.5: Focus is on the predicate within the relative clause. 'Is it true that a cucumber **GROWN** in winter is delicious.' The prosodic phrasing is indicated by curly brackets in the top part of the panel. Vertical lines mark the ends of the words and capitalization marks the focused word. Focus on the second word in the sentence inserts a prosodic boundary in the place where there was none in neutral focus condition, figure 2.3. As in the previous panel, figure 2.4, focus also deletes the prosodic structure that follows focus in the same sentence.

However, pitch range expansion as a means of signalling narrow focus is not restricted only to tone languages. Rather, pitch range expansion is a fairly universal means of signalling focus. In fact, in addition to accent marking, English and other pitch accent languages, Swedish, Japanese, etc., employ local pitch range expansion for signaling narrow focus. We can see the effects of pitch range expansion in languages that mark focus by prosodic phrasing as well, such as Korean. For example in the figures 2.3 - 2.7, the expanded pitch range can be seen for phrases that contain the focused word. We will see in Chapter 3 that Serbo-Croatian also uses this type of tonal prominence for marking narrow focus. We now turn to the relationship between prominence and focus in English.

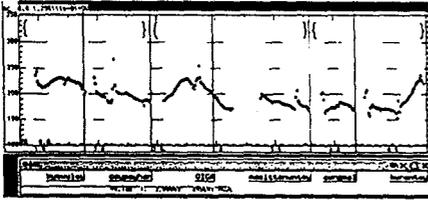


Figure 2.6: Focus is on the subject of the relative clause. 'Is it true that a CUCUMBER grown in winter is delicious.' The prosodic phrasing is indicated by curly brackets in the top part of the panel. Vertical lines mark the ends of the words and capitalization marks the focused word. Focus is on the third word in this utterance, and in comparison to the neutral focus condition, figure 2.3, focus does not insert any new prosodic structure in this position. However, focusing this word causes deletion of the subsequent prosodic structure in the sentence. This can be seen by comparing this utterance with the neutral focus, figure 2.3, in which this word is phrased separately.

2.3 Prominence–Focus Mapping

In this section I present the standard evidence that the prominence–focus mapping is not one-to-one. This indeterminacy is known as 'focus projection', or sometimes 'focus ambiguity'. I discuss the notion of focus projection in English and algorithms that have been proposed to account for it. I follow the established practice of representing the prosodically prominent morpho-syntactic unit by capitalization and the understood semantic focus by a subscript feature [F].

Consider the example in (15) and its F_0 contour in Figure 2.8.

- (15) Mary bought a new MONITOR.

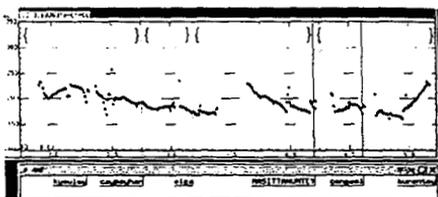


Figure 2.7: Focus is on the main predicate. 'Is it true that a cucumber grown in winter is DELICIOUS.' The prosodic phrasing is indicated by curly brackets in the top part of the panel. Vertical lines mark the ends of the words and capitalization marks the focused word. This utterance does not differ from neutral focus condition in terms of prosodic phrasing. Both have the same prosodic structure; however, the pitch range of the phrases preceding the focus is subordinated to the pitch range of the focused phrase.

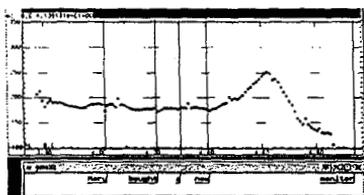


Figure 2.8: An F_0 track of an utterance of *Mary bought a new MONITOR*.

(15) is an utterance that has nuclear accent on *monitor*. The nuclear (L+H*) accent is visible in the F_0 representation in Figure 2.8 as a rise in the F_0 at the end of the first syllable in *monitor*.

An utterance such as (15) is ambiguous with respect to focus. We can utter (15) in a number of different contexts, such as the ones in (16).

- (16) a. Did Mary buy a new printer?
b. What did Mary buy?
c. What did Mary do?
d. What happened?

When (15) is used as an answer to the question in (16a), we say that the focus is narrow, because the focus corresponds to the denotation of the noun *monitor*, as a contrast to the denotation of the noun *printer* in the question. The answer is basically providing a negative answer to the yes-no question and being cooperative by providing additional information as to why the answer is a negative one. When (15) is used as an answer to the question in (16b), we say that the focus of (15) is broader, since it also includes the denotation of the adjective *new* as well. It consists of the denotation of the direct object noun phrase (NP) *a new monitor*, and it corresponds to the *wh*-word in the *wh*-question it functions as an answer to. When (15) is used as an answer to the question in (16c), we identify focus with the denotation of the phrase *bought a new monitor*, that is, the denotation of the whole verb phrase (VP). The focus in this case is even broader than when the utterance functions as the answer to (16b). Again, the focus corresponds to the *wh*-phrase in the *wh*-question it is an answer to. Finally, when (15) is an answer to a (16d), we say that the focus is broad, since it corresponds to the denotation the whole sentence. The answer again correlates with the *wh*-phrase in the *wh*-question; *what* in this case refers to a proposition.

As the preceding discussion illustrates, the terms "narrow" and "broad" are relative terms. These terms were first introduced in Ladd (1980). They refer to the size of the focus domain signalled by nuclear accent relative to a domain. The reference domain is most often a sentence. Thus, when the accent signals a focus domain which is smaller than a sentence we talk about narrow focus, whereas when the focus domain IS the sentence, we talk about broad focus. We can apply the relational notion with respect to domains smaller than a sentence. For example, the accent on *monitor* signals broad focus with respect to the NP *a new monitor*, because the NP includes other material besides the word *monitor*. If the focus is on *monitor*, as in *not a new PRINTER, but a new MONITOR*, then we have a narrow focus with respect to the NP, and so on.

Nuclear accents in certain positions in a sentence can only signal narrow focus. For example if nuclear accent is placed on *new* in (17), the focus can only be narrow.

(17) Mary bought a **NEW** monitor.

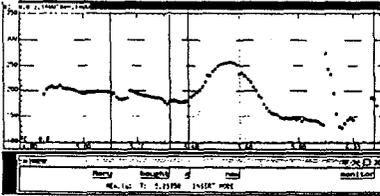


Figure 2.9: An F_0 track of an utterance of *Mary bought a NEW monitor*.

What is the significance of utterances such as (15) for the focus-prominence relation? They show us that the relationship between focus and prominence is not one-to-one. This is because the same type of prominence, i.e. nuclear accent on *monitor*, can signal four different focus domains, i.e., N, NP, VP, and S. In other words, in this case, the prominence is not sufficient to tell us what the focus domain is. It is ambiguous with respect to focus: it gives rise to focus ambiguity.

We represent the size of the focus domain in the syntactic structure (Jackendoff, 1972; Selkirk, 1984, inter alia) by a feature [F] on a constituent that can serve as a possible focus domain. Thus, (15) has four possible focus structure representations, shown in (18).

- (18) a. [Mary [bought [a new _F[MONITOR]]]]
 b. [Mary [bought _F[a new [MONITOR]]]]
 c. [Mary _F[bought [a new [MONITOR]]]]
 d. _F[Mary[bought [a new [MONITOR]]]]

Very often these four possibilities are depicted in a collapsed representation, as in (19), which is a shorthand version of the four representations in (18). The representation in (19) is a standard representation of the phenomenon we call focus projection.

- (19) _F[Mary _F[bought _F[a new _F[MONITOR]]]]

If the prominence-focus relation were a one-to-one relation, then the only focus domain we could account for by this relation in (15) would have been the narrow focus on the noun *monitor*. This is because the noun *monitor* bears the nuclear accent. This kind

of relation between prominence and focus is the one in which what is accented is the focus. Ladd (1996) calls the kinds of theories of the prominence–focus relation that assume the one-to-one mapping view Radical Theories of Focus-to-Accent relationship, or ‘highlighting’ based theories. Representative of this view are the theories presented in Bolinger (1972, 1982), Schwarzschild (1997), Chapman (1998), among others. These theories argue that the only relationship between prosodic prominence and focus has to do with the informational status (“given” vs. “new”) of the word that bears the prosodic prominence (pitch accent in the case of English). Since for Bolinger the focus-prominence relation is one-to-one mapping, focus always amounts to the word that bears the accent.¹ This means that Bolinger does not acknowledge the notion of focus projection or broad focus. He argues that speakers choose to place an accent on the word that they wish to highlight for the current communicative purpose of the utterance. Accent, according to Bolinger, is related to the speaker’s intention and in fact is unpredictable by the grammar. Chapman also argues that accent placement is a non-linguistic issue. It is not guided by the grammar but rather by the pragmatic notions such as “given/new” information. Constituents denoting new information are prosodically prominent, whereas those denoting given information are not.

However, we have just seen that the prominence-focus relation cannot be one-to-one because we have to account for the fact that prominence placement does not always create a single possible focus domain. Rather, we often find more than one possible focus domain.

¹However, even in this case the focus-prominence relation is not one-to-one because the prominence is a property of the relevant syllable, whereas the focus is the property of the denotation of the word. In other words, the only true one-to-one correspondence is present in examples such as (12) where focus is on the syllable which is also a morpheme.

The concept of focus projection goes back, at least, to Chomsky (1971).² The main research question for scholars of the focus projection phenomenon is the following: Given that the prosodic prominence is on the constituent X, which constituent Y is focused? (Or alternatively, given that the constituent Y is focused, which constituent X bears the prosodic prominence?) Theories of focus projection try to answer this question.³

In the next section, I discuss how we can account for the four different focus domains possibilities of an utterance such as (15) in a particular syntactic theory of focus projection, that of Selkirk (1995) and Rochemont (1998). In a fuller treatment of the phenomenon other theories of focus projection, such as that of Culicover and Rochemont (1983), Gussenhoven (1984, 1999) should be discussed as well. I will not consider these other theories of focus projection here. Culicover and Rochemont (1983) is a stress-based theory of focus and since I will be assuming tonally based theory of prominence, comparison with Selkirk and Rochemont's theories is more straightforward. Gussenhoven casts his theory of focus projection, the Sentence Accent Assignment Rules (SAAR), in terms of semantic constituents rather than syntactic. However, despite the reference to predicates and arguments in his rules, Gussenhoven seems to assume their syntactic correlates instead. For example, his rules explicitly involve elements for which the relation of *adjacency* holds. Invoking the concept of adjacency within a rule on focus projection clearly assumes that the rule is operating on surface syntactic strings rather than on semantic expressions such

²However, according to Jacobs (1991), the term "focus projection" first appeared in Höhle (1982) in German.

³In this thesis, I do not provide an overview of different theories of focus projection. For a comprehensive and excellent review of different theories of focus projection I refer the interested reader to chapter 3 of Winkler (1997).

as arguments and predicates. At the same time, since Gussenhoven assumes that his rules are referring to semantic constituents he does not provide explicit assumptions of syntactic structures the rules refer to. Since the study of Serbo-Croatian focus must include syntactic assumptions, given the freedom of word order, this theory would be more difficult to use as a comparative tool.

2.3.1 Selkirk (1995) and Rochemont (1998)

I chose to consider these two theories as a single theory because the authors have built on each other's work over the past two decades. The theory of focus projection developed in Selkirk (1984) was subsequently adapted by Rochemont (1986). This is a syntactic theory of focus projection because it assumes that focus corresponds to the denotation of a syntactic constituent and that the feature [F] is licensed in the syntax through an algorithm sensitive to the syntactic encoding of predicate-argument structure. This theory of focus projection consists of the following hypotheses, (20), (21), and (22), which I dub the Syntactic Focus Projection Algorithm (SFPA).

(20) **Basic Focus Rule** (Selkirk, 1995, p.555)

An accented word is F-marked.

(21) **Focus Projection** (Selkirk, 1995, p.555)

- a. F-marking of the head of a phrase licenses the F-marking of the phrase.
- b. F-marking of an internal argument of a head licenses the F-marking of the head.

- c. F-marking of the antecedent of a trace left by NP- or *wh*-movement licenses the F-marking of the trace.
- d. If a head is F, then an adjunct to the head may be F. (Rochement, 1998, p.341)

F-marking is indicated by associating the feature specification F with the F-marked constituent. In this theory, the syntactic feature F has a dual role. In addition to marking focus, it also puts constraints on the interpretation of the F-marked constituents. This is regulated in the following way:

(22) from Selkirk (1995)

- a. The focus of the sentence (FOC) is defined as an F-marked constituent not dominated by any other F-marked constituent. (p. 555)
- b. F-marked constituents which are not a Focus are interpreted as new in the discourse. (p.556)
- c. A constituent without F-marking is interpreted as given. (p.556)

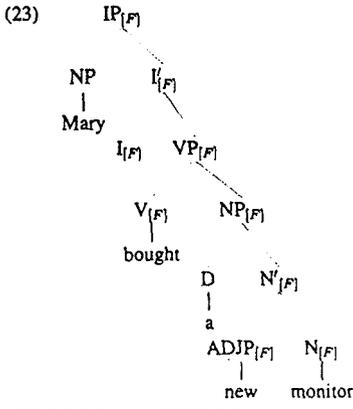
The basic focus rule, (20), states the one-to-one focus-prominence relation. It acknowledges that a basic morpho-syntactic unit (i.e., a word, an X^n where $n = 0$) bearing prominence can be the focus. However, the recursive clause of the focus projection algorithm, (21), allows constituents larger than the one bearing prominence to also be focused. These constituents must contain the prosodically prominent constituent, and the prosodically prominent constituent must be in a certain syntactic relation to the constituents that contain it. The relevant syntactic relations that license this relationship of focus projection are syntactic correlates of argument structure: internal arguments (complements) of a

head. By implication, external arguments and adjuncts are not capable of licensing focus projection.

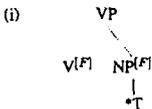
Predictions made by this algorithm can easily be verified. Internal arguments, such as a direct object, are predicted to be able to project their prominence up to the sentence level, whereas external arguments, such as subjects, will not be able to project their prominence to the sentence level. We will now go over our example in (15) and see how this algorithm makes the correct prediction about the four types of focus domains we have identified as compatible with the accent placement.

The nuclear accent in (15) is on *monitor*. The basic focus rule licenses the F-feature on the noun *monitor*. Consequently we predict that this utterance can have narrow focus on the noun. This noun is the head of its phrase, the NP *a new monitor*. By the recursive clause (21a), the NP may also be F-marked. This confirms the intuition that the focus domain can also be the direct object noun phrase. This noun phrase is an internal argument of the predicate *buy*. By the recursive clause (21b), the predicate *buy* can be F-marked and by (21a), the VP can be F-marked. This then predicts that the VP can be focused, as we have already noted. Since the VP is the internal argument of the inflectional head, I, of the sentence, I can be F-marked. Given that I is F-marked, the IP, i.e., the sentence, can be as well, by (21a). We can represent this syntactic licensing of F-markers in a syntactic tree, as in (23). Thus, the algorithm predicts the whole sentence can be focused, as indeed we have seen above. Therefore, we have shown that this algorithm successfully accounts for

the data of focus ambiguity in (15). Note that the recursive rules must be optional, because otherwise we would always end up with broad focus.⁴



⁴There is one case in which the recursive rule (21a) cannot be optional: that is the case when the verb inherits the F-marking due to the F-marking of an internal argument based on prosodic prominence, marked as "*T". If the recursive rule would "stop" after F-marking the verb, we would end up with double focus, shown in (i), rather than VP-broad focus. This is because the two F-markers are not dominated by any other F-markers and hence must be treated as FOC (i.e., focus).



The possibility of double focus with only one pitch accent is not attested. The focus projection algorithms, nevertheless, do not rule it out. However, this representation IS ruled out by the following requirements made by Selkirk (1984, p.267).

- (ii) a. For every pitch accent in the utterance there is at least one focused constituent.
- b. For every focused constituent [FOC - S.G.] there is at least one pitch accent.

So, the recursive rules are in principle optional, but in order to rule out the representation in (i), additional principles governing prominence-focus relation need to be assumed. Principles such as those in (ii), which say that every focus must contain a pitch accent seem to be adequate.

Notice that only some of the F-markers in (23) correspond to legitimate focus possibilities. For example, the F-marker on the verb does not correspond to a grammatically possible focus (when the nuclear stress falls on *monitor*). We have never identified the verb as a possible focus of an utterance like (15). For Selkirk, the only F-marker that represents focus is an F-marker that is not dominated by any other F-marker, i.e. it is not embedded. The only F-markers that can have this function in (23) are the ones on N, NP, VP, and IP. The F-markers that cannot be interpreted as foci are the ones on V and ADJP. The role of the embedded F-markers, according to Selkirk, is to keep track of the informational status of constituents; that is, whether they are "given" or "new" in the context.⁵ Constituents that are F-marked but are not foci, that is, the embedded F-marked constituents, are to be interpreted as "new".

In (15), the only major constituent that does not have an F-marker is the subject NP. That means that the subject of this utterance must be interpreted as "given". Selkirk argues that this is a correct prediction, and that if the subject is to be interpreted as "new", it must bear a pitch accent. Thus, for a sentence (15) to have a subject NP whose denotation is to be interpreted as new, in addition to the nuclear pitch accent on the noun *monitor*, the subject also must bear a pitch accent. This prediction agrees with native speaker intuitions.

An utterance with a pitch accent on the subject is represented in Figure 2.10, containing an F_0 contour of this utterance. The presence of a pitch accent on *Mary* is also represented by capitalization. In the pitch track, the pitch accent on the subject changes the pitch range

⁵Selkirk does not define the concepts "given" and "new". For now, we can assume that we have an intuitive understanding of these terms and we can think of them as corresponding to "mentioned" and "not-mentioned" in the context, respectively. In section 2.5 we will define these terms within the framework of Information Structure of Roberts (1996).

of the initial F_0 . When there was no pitch accent on the subject, as in Figure 2.8, the pitch range was around 200Hz, whereas here it is 250 Hz. Since both of the utterances were produced by the same speaker, responding to a different question, this difference is relevant. F_0 on the first syllable of *Mary* is higher in Figure 2.10 than in Figure 2.8 and it reflects the presence versus the absence of a pitch accent on the subject NP.

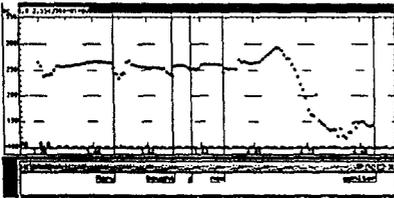


Figure 2.10: An F_0 track of an utterance of *MARY bought a new MONITOR*.

2.4 Constraints on Focus Projection in English

The SFPA encodes several constraints on focus projection. First, it distinguishes arguments from adjuncts. Adjuncts cannot project focus, whereas arguments can. Second, it also distinguishes two types of arguments: internal vs. external arguments. Only internal arguments can project focus.

2.4.1 Arguments vs. Adjuncts

The basic claim of the SPPA is that focus projection is syntactically constrained. One of the distinctions that syntactic processes are known to be sensitive to is the distinction between arguments and adjuncts.⁶ Focus projection is also sensitive to this distinction. For example, prominence on an adjunct does not allow focus to project beyond the adjunct phrase. Consider the difference in the following examples.

- (24) a. What's new?
b. John is living in a TENT.
- (25) a. What's going on?
b. #John is smoking in a TENT.

If the nuclear accent is on the argument as in (24) the sentence can function as an answer to a broad-focus eliciting question, whereas if the nuclear accent is on the adjunct as in (25), the sentence does not have the same communicative function. This distinction is apparently very robust and is encoded in the SPPA. Winkler (1997) argues that this distinction in focus projectability correctly distinguishes two types of secondary predicates: resultatives from depictives. Resultatives being arguments allow focus projection when accented, whereas depictives being adjuncts do not. This is shown in (26) and (27) (examples from Winkler (1997)).

⁶The distinction between arguments and adjuncts is not always clear cut. In many cases the standard tests fail to distinguish between the two. For example the obligatoriness/optionality distinction is not always telling. Many directional "adjuncts" behave as arguments, even though they are optional. I will not be able to go into the intricacies of this problem in the syntax and semantics of adjuncts but see Przepiórkowski (1999) and Dowty (in press) for an overview.

(26) Resultative Secondary Predicates

- a. What happened to the door?
- b. We kicked it OPEN.

(27) Depictive Secondary Predicates

- a. What did John do with the meat?
- b. #He ate it RAW
- c. He ATE it RAW.

2.4.2 Internal vs. External Arguments

2.4.2.1 Transitive Subjects

Because rule (21b) in the SFGA mentions internal arguments, and transitive subjects are external arguments, they do not license further F-marking. For example, the nuclear accent within the subject NP cannot project focus beyond the subject NP. That is, an utterance with the nuclear accent on the subject cannot serve as an answer to a question such as "What happened?", shown in (28). The pitch track in Figure 2.11 illustrates the nuclear accent placement on the subject: the peak occurs very early, on the first syllable of *Mary* and the rest of the utterance has no prominence associated with it. This lack of prominence on the string following the subject results in no pitch obtrusions and so the portion of the F_0 corresponding to the text following the subject is flat.

- (28) a. What happened?
b. #MARY bought a new monitor.



Figure 2.11: An F_0 track of an utterance *MARY bought a new monitor.*

2.4.2.2 Intransitive Subjects

Examples such as (28), *MARY bought a new monitor*, involving a transitive predicate, show that nuclear accent on the subject cannot project focus onto the whole sentence. However, there are predicates whose subjects can bear nuclear accent in order to mark the whole sentence as focus. The notion of internal argument plays a crucial role in distinguishing among different types of focus projection abilities of nuclear accent within the class of intransitive predicates. A class of intransitive predicates known as unaccusatives projects an argument structure in which the subject starts off as an internal argument of the predicate. Since the internal/external distinction is mentioned by the SFPA, the prediction is that only unaccusative subjects will be able to bear a nuclear accent that signals sentence broad focus. That this is correct has been noted as early as 1976 by Schmerling, who observed the following two naturally occurring examples.

(29) Schmerling (1976)

a. JOHNSON died.

b. Truman DIED.

Schmerling offers the following context of the two utterances:

"Sentences (92) [(29a)] and (91) [(29b)] represent reports of the death of two former presidents as I heard them and as, I assume, large numbers of Americans heard them. The different stress contours seem to be correlated with differences in the contexts in which these two reports were uttered. Johnson's death came out of the blue; it was not news we were waiting for. In other words, (92) is the type of simple news sentence discussed in the first section of this chapter. When Truman died, on the other hand, his condition had been the subject of daily news reports for some time. Thus a speaker uttering (91) could assume that the audience was aware of the possibility that this report would in fact be given." (Schmerling, 1976, p.90)

The two types of utterances are illustrated by F_0 tracks in Figures 2.12 and 2.13.

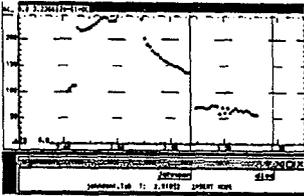


Figure 2.12: An F_0 contour of an utterance *JOHNSON died.*

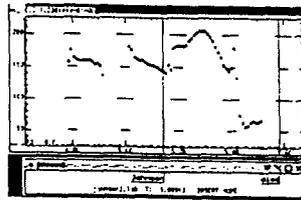


Figure 2.13: An F_0 contour of an utterance *Johnson DIED.*

The accent on the subject allows a broad focus reading in contexts in which there is no prior mention of Johnson, whereas in the same context the accent on the predicate does not. A number of intransitive predicates behave this way with respect to focus. Postulating an unaccusative argument structure in the context of the proposed focus projection algorithm nicely solves the problem of accented subjects. By assuming an unaccusative argument structure we claim that the subject of the intransitive predicate is an internal argument at D-structure. This allows the prominence on the argument to be able to project focus onto the verb via its trace by (21c), which further licenses the F-marking of the VP. This structure is represented in (30).

(30) IP_F

NP_F I'_F

I_F VP_F

V_F NP_F
 $\quad \quad |$
 $\quad \quad t_F$

Scholars who do not subscribe to either the focus projection algorithm, or the unaccusativity hypothesis of English predicates treat the accented subjects in broad focus utterances in terms of argument-predicate integration (Gussenhoven, 1983; Lambrecht, 1994; Lambrecht and Michaelis, 1998).

However, not all intransitive predicates allow nuclear accent on the subject to project focus onto the whole sentence, as shown in (31). Unergative intransitive predicates constitute such a class.

- (31) a. What happened?
b. #TOM laughed/sneezed/ran/smiled.
c. Tom LAUGHED/SNEEZED/RAN/SMILED.

For this class of predicates, the syntactic structure projects the subject as the external argument of the verb. According to the SFPA, the nuclear accent on the external argument licenses its own F-marking by the basic focus rule and no recursive clause of the SFPA is applicable. Hence, the focus is correctly predicted to be only narrow.

2.4.2.3 Stage-level vs. Individual-level Predicates

Another categorization of subjects that is claimed, (Selkirk, 1995), to have consequences for the SFPA is the semantic division of predicates into stage-level and individual-level predicates (see Carlson, 1977). We will see that this claim is untenable given the definitions in the SFPA and the current assumptions about syntactic position of subjects.

The distinction between stage-level and individual-level is a distinction between predicates such as *be available*, which is a temporary property, and predicates such as *be intelligent*, which is a permanent property of an individual. One of the tests for stage-level predication is the ability to appear in the existential *there*-construction.

- (32) a. There are firemen available.
b. *There are firemen intelligent.

Consider the difference in acceptability in (33). Only the accented subject of the stage-level predicate, *available*, is able to project focus onto the whole sentence. The accented

subject of the individual-level predicate *convenient* can only signal the narrow focus on the subject NP. For the sentence with an individual-level predicate to function as the sentence focus utterance, both the subject and the predicate must be accented.

- (33) Context: Our conference is coming up and it looks like I have to put up a lot of people with the students because very few faculty volunteered. Do you have any suggestions?
- a. HOTEL rooms are available (again).
 - b. #HOTEL rooms are convenient.
 - c. HOTEL rooms are CONVENIENT.

This semantic distinction has been accounted for in syntactic terms by Diesing (1992) building on work of Kratzer (1995, circulated since 1989). According to Kratzer/Diesing analysis the two types of predicates differ with respect to each other in terms of the syntactic structure they project, shown in (34). Stage-level predicates project a raising structure, whereas individual-level predicates project a control structure. What this means is that the subject of the stage-level predicate is generated in the specifier position of the VP and subsequently raised to the specifier position of the IP. The overt subject of the individual-level predicate is generated in the specifier position of the IP, while the null argument PRO is generated in the specifier of the VP. The overt subject controls the PRO subject in the VP. This syntactic encoding of the two types of predicates, Selkirk (1995) argues, is supposed to account for the contrast shown in and (33) and (35) of broad focus possibilities with nuclear accent placement on the subject.

(34) Stage-Level Predicates

- a. [_{IP} NP_i ... [_{VP} t_i [_{V'} ...]]]

Individual-Level Predicates

- b. [_{IP} NP_i ... [_{VP} PRO_i [_{V'} ...]]]

(35) Selkirk (1995, p.561)

- a. _F[FIREMEN are available]
b. #_F[FIREMEN are intelligent.]

The predicate *available* is a stage-level predicate, and the subject is claimed to originate in the VP, leaving a trace upon raising to the specifier position of the IP (for Case-theoretic reasons). By the rule in (21c) its trace within the VP can be F-marked, which can then license further transfer of F-marking within the VP, leading to the sentence focus.

However, the reasoning breaks down here. Selkirk (1995, p.561) suggests that the VP internal trace of the subject licenses the F-marking of the VP, which in turn licenses the F-marking of the whole sentence through a series of steps allowed by the recursive clause of the SFPA. The reasoning here is not valid because the subject is the external argument, i.e., it is in the specifier position of the VP, and not an internal argument of the head, i.e., a sister of V. Hence the steps in the recursive clause do not apply. The SFPA predicts that the same accentuation in sentences with individual-level predicate, as in (35b), is incompatible with broad focus interpretation because the subject of the individual-level predicate is never part of the VP. However, as I have just shown, the reasoning does not explain the claim of the focus-prominence pattern in (33a) and (35a). For a subject to license focus projection,

according to the SFPA, it must be an internal argument of the predicate. The hypothesis that it originates within VP is not sufficient under current syntactic assumptions, since all subjects (excluding unaccusatives) are assumed to originate in the specifier position of the VP. The problem of stage vs. individual-level distinction thus remains unresolved.

2.4.2.4 Objects

The SFPA makes reference to internal arguments. So far we have seen two types of internal arguments: direct objects of monotransitive predicates and subjects of intransitive unaccusative predicates. We have seen that the placement of the nuclear accent on these internal arguments licenses sentence-broad focus interpretation. In ditransitive predicates, nuclear accent on the indirect object is the default prominence placement when the indirect object comes last in the VP. For example, the accent occurs on the noun of the prepositional phrase in the oblique dative construction, or a locative phrase in the obligatorily transitive verbs of "putting".

- (36) a. What happened?
 b. Mary gave a new monitor to LARRY. (default prominence on IO)
 c. Mary put a new monitor on the TABLE. (default prominence on IO)

Thus, the prominence on an internal argument of the predicate always allows focus projection, as predicted by the SFPA.⁷

⁷Selkirk argues that both internal arguments of ditransitive predicates can license focus projection. In section 2.6, I will show that this analysis is dependent on the assumptions pertaining to focus interpretation and how focus domains are delineated.

Summarizing, in this section we have examined some properties and constraints of prominence-focus relation. We have seen that focus projection is sensitive to the distinction between arguments and adjuncts on the one hand, and internal arguments vs. external arguments on the other. Under the current syntactic assumptions about subjects, the SFPA is not able to account for the different behavior of stage-level versus individual-level predicates (unless subjects of stage-level predicates are treated as internal arguments on a par with unaccusatives). In Chapter 5, we will see that Serbo-Croatian does not make a distinction between these two semantic classes of predicates with respect to focus projection and so it won't be necessary to encode this distinction into the algorithm. In the next section we address the question of focus identification in context.

2.5 Identification of Focus Through Context

In the previous section, we have seen that the focus-prominence relation is not always one-to-one, and consequently that prosody is not sufficient to unambiguously identify the focus of a sentence. However, we have also seen reason to hope that we can identify the focus of an utterance by matching the prosodic cues with a possible context in the form of a *wh*-question. That is, we have used one of the standard tests for focus: pairing an utterance with a *wh*-question that it can answer. According to the literature, this is one of the oldest tests for focushood, dating back to Paul (1888/1970). Thus, the focus of an assertion is that portion of the assertion that corresponds to the question word in a *wh*-question. At the very least this shows that focus, more clearly than any other linguistic phenomenon, relies on discourse for its identification. Consequently, any adequate, let alone complete, theory

and understanding of focus depends on understanding discourse and the way information is exchanged in discourse. I will, therefore, situate my assumptions about focus in a theory of Information Structure (Roberts, 1996) that models exchange of information in discourse and provides an explicit connection between *wh*-questions and declarative statements.

2.5.1 Roberts (1996): Information Structure

The basic idea of this approach is that focus indirectly affects interpretation by constraining the context in which a particular utterance may felicitously occur. How does focus constrain context of an utterance? It does so by requiring that the focus presuppositions be satisfied in the common ground (a technical notion, to be explained shortly). If the presuppositions are satisfied (or accommodated; and all other independent factors that determine felicity, such as uniqueness presuppositions, etc., are also satisfied), the utterance is felicitous, otherwise not.

The function of focus is to allow a hearer to retrieve what the speaker takes to be the context of the utterance by inferring some of the propositions assumed to be in the common ground. By relating an utterance with its appropriate contexts, focus performs a pragmatic function. In some cases, then, focus does not directly affect the truth conditions of an utterance. However, in cases where context retrieval is necessary for the computation of truth-conditions, such as in finding the right domain restriction for quantificational operators such as *only*, focus directly contributes to truth conditions, as reported in Rooth (1992).

This approach thus integrates a functional approach to focus with the formal pragmatic approach proposed in Rooth (1992). This integration is achieved through a formal model of the information structure of a discourse. In this model presuppositions relate focus (a

linguistic entity) and information in the context (a non-linguistic entity). In this conception of information structure, information structure is not a level of linguistic abstraction that correlates linguistic objects with their pragmatic functions, as in the system developed in Vallduvf (1992). Rather, information structure is a non-linguistic object: it is the structuring and relation among propositions in discourse. V

Roberts' (1996) concept of information structure assumes that language is a special kind of game, an idea originally proposed by Wittgenstein (1953). This idea was subsequently developed by Hintikka (1973) in game-theoretic semantics and furthered by Carlson (1983), and also Lewis (1979). Participants in a discourse are engaged in a language game. As with any human activity, agents engaged in a discourse are assumed to have plans, goals, and intentions (Grosz and Sidner, 1986). Discourse enables people to enrich the information they have in common (Stalnaker, 1979). This theory assumes language is used in order to share information and arrive at recognition of common beliefs. Discourse is a structured set of utterances with a goal to exchange information.

The context of an utterance, in this theory, is modeled in terms of Stalnaker's notion of common ground. The common ground is a set of propositions held by the interlocutors to be true (or at least behaving as if it is so), and the context set is the intersection of these propositions. Technically, since propositions are sets of worlds, a proposition is true in a world if and only if that world is a member of that proposition, and so the context set is the set containing all worlds in which all propositions in the common ground are true. In line with Stalnaker's idea of interlocutors trying to reduce the context set to a singleton set, the ultimate goal of any discourse is to find out the way things are. Thus, the ultimate goal of any conversation is to answer the so-called big question: "What is the way things are?"

The discourse as a game is modeled in terms of moves. There are two kinds of moves: set-up moves, and pay-off moves. The moves are semantic objects: **questions** instantiate set-up moves, and **assertions** instantiate pay-off moves. Assertions are modeled as propositions, and questions are modeled as sets of propositions (Hamblin, 1973).

In playing the discourse game participants make moves obligating one another to subsequent moves. Question/answer interaction is at the core of the game. One participant sets up the immediate goal, whereas the other may be obliged to reach that goal. Most often the goals are answering a question. Reaching the goal may be direct, or participants may plan strategies of getting as close to the goal as possible. Planning strategies involves planning a particular sequence of moves.

Strategies in a discourse game rely on semantic relations between questions. For example, instead of completely answering the (big) question, (the overall "discourse purpose" in Grosz and Sidner's terms) we can partially answer the (big) question (subordinate "discourse segment purpose"). By doing so, we may have answered a different but related question. Questions may be related to one another by entailment. For example, the question "What did you do today?" entails the question "What did you do this morning?". This is because, by answering the first question completely, one has also answered the second question. In this case the first question is a super-question and the second question is a sub-question. In choosing a strategy in a discourse game we may choose to answer a sub-question of the explicit question and thus give a partial answer to the super-question. This strategy seems to be very common, since we often either do not possess enough information to give complete answers or choose not to. Table 2.1 briefly summarizes the basic design of the discourse game.

Discourse Game	
Goals	
The ultimate Goal:	"What is the way things are?"
Immediate Sub-Goals:	"What is X like?" "What is Y like?", etc.
Moves	
Set-up	questions
Pay-off	assertions
Strategies	
Set-up	ask a sub-question
Pay-off	give a partial answer

Table 2.1: An overview of the discourse game, which consists of goals, moves, and strategies.

The information structure of a discourse (IS_D) is a tuple: $IS_D = (M, Q, A, '<', Acc, CG, QUD)$, where M is a set of moves, Q a set of questions, A a set of assertions, and Acc a set of accepted moves. $Q, A,$ and Acc are subsets of the set of moves, M . A precedence relation, ' $<$ ' holds over the set of moves, creating a total ordering on the set of moves. CG is a function whose domain is the set of moves, M , and whose range is a set of propositions. It gives the common ground just prior to an utterance, CG_m . QUD (Question Under Discussion stack) is a function which yields the immediate question under discussion by picking

from the set of moves the most recently accepted question to which the common ground does not entail an answer. Since moves are semantic objects, they can be either explicit, syntactically realized as either **interrogatives** or **declaratives**, or implicit, inferred on the basis of explicit moves.⁸ For example an utterance such as (37) is an explicit assertion.

(37) Today is a nice day.

However, we can conceive of (37) as an answer to an implicit question, such as the one represented by an explicit interrogative, as in (38).

(38) What's today like?

There are two functions in this conception of the information structure: the CG (common ground) and the QUD (question under discussion). The common ground is a function from the set of moves to sets of propositions. For any move, this function gives a set of propositions in the discourse prior to the move, i.e. the common ground at that time. A proposition expressing the existence of a move in the set of moves is also an element of the common ground. The QUD is a function from the set of moves to ordered subsets of accepted questions. This function allows us to be able to know what the current accepted question is, or technically, the question under discussion (QUD). Table 2.2 presents this information structure model.

A discourse consists of sequences of moves assumed to be governed by rational behavior, such as Gricean maxims. The pragmatic function of focus, in this system, crucially

⁸We will keep the distinction between a semantic object and a syntactic object by referring to semantic objects as questions and assertions, and to syntactic objects as interrogatives and declaratives, respectively.

Information Structure	
$IS_D = (M, Q, A, Acc, <, QUD, CG)$	
M = the set of Moves	$Q \subseteq M$ = the set of questions $A \subseteq M$ = the set of assertions $Acc \subseteq M$ = the set of accepted moves $<$ = the precedence relation
QUD = the-question-under-discussion stack	QUD = a function from M to ordered subset of $Q \cap Acc$, such that for all $m \in M$ (a) for all $q \in Q \cap Acc$, $q \in QUD(m)$ iff <ol style="list-style-type: none"> i. $q < m$ ii. $CG(m)$ fails to entail an answer to q and q has not been determined to be practically unanswerable (b) QUD is totally ordered by $<$ (c) $\forall q, q' \in QUD(m)$, if $q < q'$, then the complete answer to q' contextually entails a partial answer to q .
CG = Common Ground	CG = a function from M to sets of propositions yielding for each $m \in M$ the CG of D just prior to the utterance of m . We require that <ol style="list-style-type: none"> (a) $\forall m_k \in M$, $CG(m_k) \supseteq \cup_{i < k} (CG(m_i))$ (b) $\forall m_k \in M$, $CG(m_k) \supseteq \{m_i : m_i < k \wedge m_i \in Acc \setminus Q\}$ (c) $\forall m_k, m_i \in M$, $i < k$. <ol style="list-style-type: none"> (i) the proposition that $m_i \in M$ is in $CG(m_k)$ (ii) if $m_i \in Q$, the proposition that $m_i \in Q$ is in $CG(m_k)$ (iii) if $m_i \in A$, the proposition that $m_i \in A$ is in $CG(m_k)$ (iv) if $m_i \in Acc$, the proposition that $m_i \in Acc$ is in $CG(m_k)$ (v) $\forall p, p \in CG(m_i)$, the proposition that $p \in CG(m_i)$ is in $CG(m_k)$ (vi) whatever the value of $QUD(m_i)$, the proposition that that is the value of $QUD(m_i)$ is in $CG(m_k)$

Table 2.2: Information Structure of a Discourse (Roberts, 1996, p.99)

depends on the semantics of moves (questions and assertions). Every move is associated with two types of meanings: proffered meaning and presupposed meaning.

The proffered meaning of a *wh*-question is defined as a set of propositions, the Q-alternative set, obtained by instantiating the variable corresponding to the *wh*-word with all the appropriate elements in the domain. The pragmatics of questions is such that it asks the hearer to choose those propositions from the Q-alternative set which are true.

The proffered meaning of an assertion is a proposition expressed. A part of the presupposed meaning of an assertion pertains to its focal alternative set. The focal alternative set of an utterance is derived by replacing the focused constituent with a variable and creating a set of propositions by instantiating the variable with appropriate elements from the domain.

The focus of an utterance, in this theory, is marked by a syntactic feature [F] on the syntactic constituent corresponding to the focus. Prosodic prominence and focus are assumed to be related via the SPPA. By signalling focus, prominence signals part of the presupposed meaning of an utterance; i.e., the meaning of prosodic prominence is presuppositional. This presupposition pertains to felicity. In order to be felicitous, an utterance must be congruent to the current question under discussion.

An utterance is congruent to a question if and only if the Q-alternative set (Q-alt) of the QUD and the focal alternative set (F-alt) of the utterance are equivalent. For example, let's assume the domain of individuals shown (39):

(39) $D = \{Mary, Susan, John, Leslie\}$

The proffered meaning of a question in (40a) is a set of propositions, its Q-alternative set, represented in (40b).

(40) a. Who loves John?

b. Q-alt = { *Mary loves John, Susan loves John, Leslie loves John, John loves John* }

The presupposed meaning of an utterance such as (41a) is its Focal-alternative set, represented in (41b), which we get by replacing the focused constituent with a variable and instantiating the variable by individuals from the Domain in the model.

(41) a. Susan_F loves John.

b. F-alt = { *Mary loves John, Susan loves John, Leslie loves John, John loves John* }

Because F-alt \equiv Q-alt, we say that the utterance in (41a) is congruent to the question in (40a).

Since this theory hypothesizes that the meaning of prosodic prominence is the presupposition that the utterance is congruent to a question under discussion, then we can infer the focus of an utterance by computing the F-alternative set. The F-alternative set in turn allows us to arrive at the Q-alternative set, i.e., the question. We have seen that prominence does not give us focus automatically, since the focus-prominence relation is not a one-to-one mapping. However, using the SFPA we can arrive at a finite set of possible foci, for which computation can proceed. The immediate context of utterance then, allows us to choose the relevant focus domain. Gricean Relevance is a necessary ingredient of determining the intended choice of focus in a context.

If we assume that the context of an utterance is partially defined in terms of the current QUD, it is possible then, to give a definition to the notions such as "given" and "new"

information, discussed earlier in relation to the SFPA. "Given" information can be defined as present in the QUD, whereas "new" information is absent in the QUD.⁹

That the pragmatic function of focus should be defined in terms of "new" information is a hundred-year old idea. It seems that everyone who has worked on focus agrees that the function of focus is pragmatic, in the sense of relating contexts of utterance and interpretation. However, focus has remained an elusive topic for reasons that have to do with being able to adequately describe contexts and the way focus constrains them. What has been missing is a way to keep track of information and relate it according to linguistically relevant properties, such as familiarity, salience, moves, etc. The definition of information structure in Roberts' theory provides us with an explicit way to relate an utterance with a context in terms of the QUD. Combining this with semantic tools, such as alternative sets, presuppositions, and the pragmatic concept of common ground, enables us to explain the observed relation between questions and answers.

2.5.2 Accommodation and a Strategy of Inquiry

A crucial notion in this theory of information structure is its conception of information as semantic objects. This has a consequence that information may be invoked in many different ways and not just linguistically. Immediate non-linguistic context, such as situational, social, and other types of context influence the structuring and addition of information into the common ground. One of the relevant assumptions is that speakers are cooperative and

⁹There may be other notions of "given" and "new" that are relevant for semantic and pragmatic descriptions of linguistic entities, such as the notion of familiarity used in the theory of definite NPs by Heim (1980), etc. The definitions here do not preempt these other possibilities.

thus are willing to accommodate information that has not been linguistically added to the common ground.

Accommodation plays a big role in discourse. By assuming the presuppositional meaning of prosodic prominence, this theory claims that each utterance is congruent to the question under discussion. Because questions are semantic objects, it is not necessary that the question under discussion be explicit. Questions may also be implicit: when they are, they are usually accommodated into the common ground, assuming the resulting context would observe the logical constraints Roberts imposes on sequences of questions in a QUD stack.

Explicit questions demand an answer from a cooperative interlocutor. However, the interlocutor may not always have a complete answer to the question. Depending on the goals and intentions of the participants in a discourse, the interlocutor may choose a particular strategy of inquiry as a way of answering the question. This strategy may involve providing an answer, which, even though it doesn't answer the question completely, it still provides some relevant information towards answering the explicit question. When this happens, the interlocutor has chosen to answer a different question than the explicit question. In such a case, the question being answered is implicit but is nevertheless a felicitous part of the information structure. The success of this hypothesis as a predictive theory will depend on the extent to which the implicit question can be retrieved by computing the focus with the help of prosodic prominence, the SFPA, the explicit question, and the maxim of Relevance.

To see how all of this works in practice, imagine the following scenario:

- (42) MARKET SCENARIO
 Scene: at the farmer's market
 Actors: Mary, John, Helen, Rose

Happened previously: Rose bought some fresh raspberries, Helen bought some yellow-Finn potatoes, John bought some apples. Time to go home.

(43) Mary: Why are we waiting?

(44) John: Now. HELEN is buying raspberries.

L+H*

L-L%

The utterance in (44) is possible given that we know that Rose just bought some raspberries. If we assume that the indicated prosody of (44) signals only narrow focus on the subject NP, as all theories of focus projection do (Selkirk 1984, 1995, Rochemont 1986, 1997, Gussenhoven 1983, 1999, inter alia), then the directly congruent question to (44) is "Who bought raspberries?" However, we know that was not the explicit question. The explicit question, (43), calls for an answer whose set of alternatives are of the propositional type. Hence, among the possible answers could have been the following set: A: { *Rose is talking to a friend; The bus doesn't leave for another 15 minutes; Helen went to the bathroom; etc.* } Instead, with the given domain of individuals, we have the following set of alternatives B: { *Helen is buying raspberries; John is buying raspberries; Rose is buying raspberries; Mary is buying raspberries* }. How do we come to understand that (44) is competing with the alternatives from the set A and not with the alternatives from the set B, as its prosodic structure would lead us to assume? We know this because as interlocutors we have accommodated the following implicit intermediate steps:

- (45) a. Why are we waiting? — explicit question
b. What is happening? — implicit question

- c. Who is doing what? — implicit question
- d. Who is buying what? — implicit question
- e. Who is buying raspberries? — implicit question

The set of questions in (45) is a strategy of inquiry pursued by the interlocutors in the market scenario. Accommodating this implicit set of questions as an intermediary between the answer and the explicit question, the answer can be taken to be a relevant (possibly partial) answer to the explicit question. In addition to answering the explicit question, the answer also confirms the shared common ground by signalling the presupposition that someone else bought raspberries. The implicit questions in (45) are related to one another by a partial-answer entailment.

I am assuming that the explicit question, the *why*-question always elicits sentence-broad focus. That is, an answer to a *why*-question in (43), can also be an answer to a "What happened?" type question since "why?" means "what happened that caused ...?" A strategy in answering the "What happened?" type question, then, can be a strategy involving answering a more specific question such as "Who did what?" The question "Who did what?" can be partially answered by answering the question "Who bought what?" The question "Who bought what?" can be partially answered by (completely) answering "Who bought raspberries?" and so on. This relationship among questions and consequently the relationship among answers to these questions are a part of our knowledge of communicative strategies and inference based reasoning in discourse. Focus capitalizes on this knowledge by using shortcuts.

Thus, in order for the exchange between Mary and John, shown in (43) and (44), to be felicitous, some set of intermediate implicit questions such as the one proposed in (45) had to be accommodated as a plausible strategy for answering the explicit question. The answer, i.e. the pay-off move, has invoked an implicit QUD, which was the speaker's way of addressing the explicit question. The relationship between the explicit question and the implicit QUD is a chain of sub-question relations. Mary must assume that John is being cooperative and hence that his answer is relevant. The entailment relationship between implicit questions and the explicit question, on the one hand, establishes the connection between the answer and explicit question on the other.

Notice that John could have also answered Mary's question by uttering (46).

(46) John: Now, HELEN is buying RASPBERRIES.
 L+H* L-L% L+H* L-L%

On the basis of the prosodic rendition, the utterance in (46) is ambiguous with respect to focus: it can be an answer to either *Who is doing what?* or *Who is buying what?*. On the assumption that *why*-questions elicit broad focus, i.e. the question "What is happening?", in both cases, the relationship to the explicit question is not direct. Rather it is a sub-question of the main question. However, the connection between one of these questions and the main question in this case is more direct (closer) than in the case of (44).

2.5.3 Immediate Context and Focus Domain

By 'focus domain' I mean the size of the syntactic constituent in a sentence corresponding to the focus, whether it is sentence-broad focus, VP-focus, and so on. How do we decide on

the focus domain of an utterance? We have seen that the prominence-focus mapping does not determine the focus domain, but only constrains it. Prominence-focus mapping only reduces the number of possible focus domains. We have said that the focus domains are further constrained by the context of the utterance. The relationship between the context of utterance and the focus domain usually works in the following way: the richer the relevant context, the narrower the focus, and vice versa.

Our test for focus of an assertion is finding a congruent question, on the basis of prosody. In other words, on the basis of prominence and the SFPA, we can deduce a set of possible implicit questions a declarative sentence can serve as an answer to. It is on the basis of the context of utterance, i.e. the common ground at that moment in discourse, that we can further reduce this set to a single QUD and thus disambiguate the focus.

Sentence-focus is an utterance in which the entire sentence constitutes the focus domain. Sentences with this type of focus are said to be able to occur in so-called out-of-the-blue contexts. Moreover, utterances in this type of context are also often referred to as utterances "out of context". The collocation "out of context" must not be understood literally, because every utterance has a context. The context in this case may be impoverished, in the sense of having a very small set of shared assumptions among interlocutors, or it may come without a relevant connection to whatever has occurred prior to it.¹⁰

The set of shared assumptions among interlocutors, the common ground (more precisely the context set), is never empty. It always contains at least the propositions about

¹⁰In Serbo-Croatian, the phrase that is used to convey this type of context is *iz nevezanog* 'from unconnected' and it connotes an utterance without any obviously relevant connection to prior context. This locution seems a fairly good characterization of this type of context.

time, and the location of interlocutors, the acknowledgment of the interlocutors that the other exists, and so on. There may be many other propositions in the common ground that are shared. However, the crucial criterion in deciding the richness of the context is the number of shared propositions that are **relevant** to the utterance. I will assume the following definition of relevance.

(47) **Relevance**

A proposition **P** in the common ground is relevant to an utterance **U** iff **P** entails a part of the information conveyed by **U**.

This definition covers utterances that are either questions or assertions. To see how this works consider the following scenario. Let's suppose I haven't seen you all day and I come to your office at the end of the day and say "What happened today?" The propositions in the common ground include the time of the day, the weather conditions, my appearance, your appearance and so on. None of these propositions in the common ground seem relevant for my utterance. I am asking you to describe the events of the day that are not connected to anything in the immediate context. Now imagine the same scenario but in which you are crying when I walk in. I ask the same question. This time, the common ground also contains the proposition that you are crying. My question now can reasonably be interpreted as "What happened today? Why are you crying?" That is, the proposition in the common ground that you are crying is now relevant to my question. It narrows down the domain of interest for my question. I am no longer interested in all the things that you might know happened today, but only in the one that may have caused your distress. Thus, part of the information that my question is asking about is entailed by the proposition present in the

common ground at the time of utterance: the fact that you are crying. It is in this sense that my question "What happened?" can be considered out-of-the-blue in the first case, but connected to the immediate situation in the second case.

Thus out-of-the-blue sentences are those whose context does not provide enough relevant information for connecting them to whatever has preceded them. It may seem that beginnings of discourses will qualify as out-of-the-blue context. This may be true of interlocutors who have met for the first time. However, notice that for interlocutors who have known each other for some time, a discourse may begin where it left off at some prior time. This shows that the beginnings of discourses are not necessarily starting anew or without prior context to be linked to.

Questions that are often used to elicit and invoke sentence broad focus are questions such as "What happened?", "What's new?", "Have you heard?", but also *why*-questions, etc. Answers to these questions very often may also assume a great deal. For example, they may assume a relevant domain of individuals known to both speakers. This allows the use of proper names in utterances without any introduction. Even when an individual or entity that is invoked by a proper name is not familiar to the hearer, the hearer is usually willing to accommodate the persons's or entities's existence and familiarity of the name's referent. Because of this, in an utterance of a sentence-broad focus, subjects often denote familiar information. However, the familiarity of the denotation of the subject NP does not necessarily pertain to "newness" of information relevant for focus. It seems that focus relevant newness must also include salience (see Culicover and Rochemont, 1983; Rochemont, 1986).

An utterance is said to have VP-focus if it can function as an answer to a question such as "What did X do?". We will use this probe for VP focus extensively in Chapter 5, which deals with focus projection in Serbo-Croatian.

2.5.3.1 Focus Interpretation

Notice that the rules of focus projection encoded in the SFPA provide focus domains that correspond only to syntactic constituents. That is, there is no focus domain such that it consists of a syntactic string which is not a syntactic constituent. For example, in a transitive sentence, the string corresponding to the subject and the verb can never be a focus domain. This is because the subject and the verb do not form a syntactic constituent by themselves. The smallest syntactic constituent that includes the subject and the verb is the sentence, but the sentence also includes the object as well. Thus, one of the commitments of this theory of focus projection is the assumption that focus always corresponds to a syntactic constituent.

This assumption is challenged by many researchers (see for example Vallduví, 1992; Vallduví and Engdahl, 1996b; Lambrecht, 1994; Zubizarreta, 1998). For example, consider the following example slightly adapted from Vallduví and Engdahl (1996b, p.470).

- (48) a. Context: You shouldn't have brought chocolates to the White House.
b. _F[The president HATES] chocolate.

According to Vallduví and Engdahl, the focus domain in (48b) consists of the subject and the verb, as shown by the subscript "F". Since this string is not a syntactic constituent under anyone's syntactic analysis of the sentence, we have to conclude that under their

analysis focus need not always be conveyed by a syntactic constituent.¹¹ But we have said that in a theory that adopts the SFPA, the focus always corresponds to a syntactic constituent. So, how does the SFPA account for a sentence such as (48b)? Under the SFPA analysis, the focus domain in (48b) can only be either the whole sentence, the verb phrase, or just the verb, but never the verb and the subject as in the analysis presented by Vallduví and Engdahl. The crucial distinction between these two types of analyses lies in the use of F-markers (or F-feature).

In Vallduví and Engdahl's system the F-feature is only used for the purpose of marking the focus, FOC in Selkirk's notation. In a theory employing the SFPA, there are two types of F-markers: embedded and non-embedded. The non-embedded F-markers correspond to foci (FOC), whereas the embedded F-markers keep track of the informational status of a constituent's denotation. Only constituents denoting new information are F-marked, constituents denoting given information are not F-marked. If we want to translate Vallduví and Engdahl's claim about the focus structure of (48b) into an analysis using the SFPA, we would have to claim that the whole sentence is in focus because this is the only focus structure that includes both the subject and the verb into the focus domain. This focus structure is represented in (49).

(49) F [The president F [F {HATES} chocolate..]]

¹¹In his analysis of Catalan, Vallduví assumes that non-focused constituents move out of the core clause, and hence in Catalan, the focus is always associated with a syntactic constituent, the minimal IP. This analysis is plausible for Catalan, given its syntax. However, we could not assume the same mechanism to be operative in English, and hence in English, the focus/background partition would have to be done along non-constituent lines, as implied in (48b).

In (49), the SFPA analysis assumes that the NP *chocolate* is also part of the focused constituent in distinction to the analysis of Vallduví and Engdahl. The reason this can be done under the SFPA is because the NP *chocolate* can be left without an F-marking even if it is within a FOC. The lack of F-marking entails that it must be interpreted as given in the context. In the above context, this is possible by virtue of *chocolate* being mentioned in the previous utterance. The reason the NP *chocolate* must be included into the focus domain under the SFPA is that there is no other way to include the subject into the focus domain, when the verb carries the main prosodic prominence within the sentence. The focus domains are only defined for syntactic constituents under the SFPA.

However, this utterance is also compatible with two more focus structures, shown in (50). Given the context of this utterance and under the theory of information structure assumed here, this utterance, I would argue, has the focus structure indicated in (50b). That is, the verb constitutes the sole focus domain. The denotation of the direct object NP is given by the prior utterance and the denotation of the subject NP is also entailed by the same assertion. It is invoked by the mention of the NP "White House". Thus, the utterance we are discussing is actually congruent to the question "How does president feel about chocolate?" We will see in Chapter 5 that the same utterance in Serbo-Croatian is compatible with word orders and prosody that invoke verb-focus only.

- (50) a. The president F [F [HATES] chocolate.]
b. The president F [HATES] chocolate.

What are the consequences of the commitment to syntactic constituency of focus? The main consequence pertains to interpretation: How is focus interpreted and where?

Even though Selkirk does not discuss the issue of focus interpretation, it seems that the standard assumption regarding focus interpretation of the theories that adopt the SFPA is that focus is interpreted in or via the semantics. Since syntactic structure is the input to the level of Logical Form (LF), the F-marking on a syntactic constituent is to be interpreted at that level. There have been two major proposals regarding the interpretation of F-marking at LF: (i) the movement or scope theory (Chomsky, 1976; Culicover and Rochemont, 1983; Rooth, 1995) and (ii) the in-situ theory (Rooth, 1985; Kratzer, 1991; Rooth, 1992).

The scope theory of focus assumes that the focused constituent moves at LF to the focus position at the front of the sentence leaving a variable in its place. Chomsky (1976) points out that focus movement at LF has the same property with respect to binding as does quantifier raising. That is, there is a similarity between a focused NP and a quantified NP with respect to pronoun binding. Neither can bind a pronoun. This is illustrated in (51). The sentences are marked with '*' because the interpretation in which the pronoun is coreferential with *John* in (51a) and the interpretation in which the pronoun in (51b) is dependent on which soldier we pick are unavailable. That is, neither of these sentences can have the same meaning as the ones below them.¹²

- (51) a. *The woman he_i loves betrayed JOHN_i.
 ≠ The woman John_i loves betrayed him_i.
 b. *The woman he_i loves betrayed every soldier_i.
 ≠ Every soldier was betrayed by the woman he_i loves.
-

¹²For (51a) to have the interpretation intended by the coindexing, the accent must be on the verb, i.e., *The woman he loves BETRAYED John*.

The assumption that focused constituents are fronted at LF provides a unified account for the lack of coreference between the pronoun and a focused expression or a quantifier. Moreover, it also unifies focused expressions and *wh*-expressions, which are thought of as being inherently focused. However, two types of objections to this account are found in the literature. First pertains to the island constraints. If focused constituents move at LF, then this movement ought to obey island constraints. However, it is well known that focus does not obey island constraints (see Rooth, 1985, 1995; Kratzer, 1991). That focus is insensitive to islands is often illustrated by the phenomenon called association with focus. Since Jackendoff (1972) it is widely accepted that certain adverbs such as *even* and *only* associate with focus. This relationship between *only/even* and the focus is captured by the assumption that at LF the two must be sisters. That is, at LF, the focused phrase moves from its S-structure position and adjoins to the focus-sensitive adverb. This is illustrated in (52).

- (52) a. John only loves SUSAN. S-structure
 b. John only Susan_i loves t_i. LF

In addition to examples such as (52), where the movement of the focused phrase at LF is legitimate, we also find examples in which *only* associates with the focused phrase within an island, such as a relative clause. The movement of the focused phrase out of the relative clause violates the Complex NP Constraint. The LF structure in which the requirement that the focused phrase be a sister to the focus-sensitive adverb should consequently be illegitimate. This is shown in (53). This reasoning relies on the fact that other types of A' movements from the same position, such as *wh*-movement and quantifier raising, are

unacceptable. For example, *wh*-movement out of the relative clause is ungrammatical, as (54) shows; and quantifier raising out of the same position is also ruled out, as the impossibility of readings in which the quantifier within the relative clause takes scope outside of the relative clause attests. This is shown in (55).¹³

- (53) a. John only tolerates [the man [(whom) SUSAN married]_{rel.cl}]_{NP} S-STR.
 b. John only Susan_i tolerates [the man [(whom) t_i married]_{rel.cl}]_{NP} LF

(54) *Who_i does John (only) tolerate the man whom t_i married?

- (55) a. Some professor liked the paper that every student read.
 b. the paper > every student
 c. *every student > the paper

Given that neither overt, (54), nor covert movement, (55c), can occur from within this kind of island, the hypothesis that focused phrases are moved at LF to a scope position has little support.

The second problem is pointed out by Zubizarreta (1998) and it has to do with the issue of whether focus is a syntactic constituent. If we assume that focus may not be conveyed by a syntactic constituent then the assumption that focus is interpreted at LF via Focus-Movement is untenable because only constituents may be moved. This objection is only

¹³The scope relations between the two quantified NPs is expressed by the ">" relation. The NP on the left has wider scope from the NP on the right.

relevant to accounts that assume that focus can correspond to a non-constituent, such as the one advocated by Vallduví (1992).

The in-situ theory of focus (Rooth, 1985) assumes that focused constituents do not move at LF, rather the F-marking generates a second dimension of meaning, the focus meaning. This meaning is arrived at by replacing the focused constituent with a variable of the appropriate type and creating a set of meanings by instantiating the variable with the contextually appropriate meanings of the same type. This set is called the "alternative set". Thus the F-marking enriches the interpretation by generating in addition to the ordinary meaning an alternative set for constituents that are focused. This theory avoids the problem of island constraints. However, the problem of constituency raised for the ex-situ theory is also a problem for the in-situ theory. If a non-constituent is the focus of sentence, say the subject and the verb as in (48b), then the in-situ theory of focus interpretation will generate two separate focus meanings, one for the subject and one for the verb. This means that the focus would have to be treated as multiple foci instead. But, if the interpretation arrived at is the one for multiple foci then the utterance is expected to be congruent to a different question, such as the one in (56a), contrary to fact. Moreover, the subject would have to be F-marked, which it cannot, since it bears no prominence.

- (56) a. Who feels what about chocolate?
b. #The president HATES chocolate.

Thus, the assumption that the subject and the verb can be the focus is untenable in a theory that interprets focus at LF. The only solution in this theory is to assume that focus must be a syntactic constituent.

One possibility for resolving this conflict between focus interpretation and the syntactic constituency status of the corresponding focus domain is to assume that focus is not interpreted at the level of LF, or some other equivalent level of semantic interpretation. Rather, one may assume that there is an independent level of focus interpretation, working in parallel with the semantic interpretation. An independent level of focus interpretation is precisely what the proponents of the claim that focus need not be conveyed by a syntactic constituent propose. Vallduví (1992) proposes an independent level of Information Structure (IS), and Zubizarreta (1998) an independent level of the Assertion Structure (AS). The IS is derived directly from the S-structure. Its primitives are *hmk*, *focus*, and *tail*. The AS, on the other hand, is derived from LF by some interpretive mechanisms. Neither of these proposed levels of focus interpretation take syntactic constituents as their primitives. In IS the elements that constitute focus are syntactic strings, given that the input to IS is S-structure. In AS, *focus* is defined as an assertion, a semantic object derived from LF irrespective of syntactic constituency.

However, there are problems with both of these views in which focus interpretation is independent of LF. Vallduví's Information Structure is a level of linguistic representation directly derived from S-structure. The structure of IS represents only a new partition on syntactic units, one that is independent of syntactic constituency.¹⁴ The informational component provides instructions for the information structure primitives with respect to a knowledge store. The instruction for *focus* is to add information. The problem is that IS

¹⁴As mentioned earlier, in Catalan, according to Vallduví, *focus* does turn out to correspond to a syntactic constituent, the core IP. But this seems coincidental and largely due to the syntax of Catalan. The theory of Information Structure, that Vallduví proposes does not require that *focus* be a syntactic constituent, and it would be very hard to argue that it is in English and possibly other languages.

is a partition that still contains syntactic strings, rather than meanings. How can syntactic strings add information? That is, they need to be interpreted first. But, in Vallduví's system information packaging instructions, such as focus, are carried out on syntactic elements, rather than meanings. If information packaging instruction were to be carried out on meanings then the level of IS would also have to include the interpretive level. Since Vallduví assumes that truth-conditional meaning is carried out via LF, this interpretive level would then be redundant. I consider this a serious problem for this theory, despite its intuitive appeal and simplicity.

The level of Assertion Structure does not have the problem noted for the level of IS, because AS is derived from LF, and thus operates directly with information, i.e., meanings. The problem with the AS theory are the interpretive mechanisms used for deriving the assertion structure. In this theory, it is assumed that a sentence is partitioned into focus and presupposition (or background assertion). Focus is the non-presupposed part of the sentence. The presupposed part of a sentence corresponds to a *wh*-question. So far, this is similar to the assumptions that I have made as well. The difference comes about in deriving the meaning of the presupposed part of the sentence. Zubizarreta assumes that the presupposed meaning of a *wh*-question is an existentially quantified statement (i.e., a background assertion in the AS). Assuming that the questions and answers share the same presupposition, she claims that the presupposed part of the sentence is an existentially quantified statement, (58a). Focus then is a value supplied for the definite variable whose restriction is the presupposition, (58b).

(57) a. Who bought a computer?

b. MARY bought a new computer.

(58) ASSERTION STRUCTURE of (57b)

a. *Someone bought a new computer.* presupposition

b. *The person who bought a new computer is Mary.* assertion

There are two problems with this analysis. One is the treatment of the presupposed part of the sentence and the other is the treatment of focus. The assumption that questions presuppose existentially quantified statements seems to be too strong. As Jackendoff (1972, p.246) points out negative answers would be infelicitous with *wh*-questions if questions presupposed existentially quantified statements, such as (58a), because the answer would contradict the presupposition. (For example, if the answer to (57a) is *Nobody*, the answer would be infelicitous since it contradicts the presupposition of the question.) Yet, negative answers are not infelicitous with *wh*-questions.¹⁵ Another argument that prosodic focus in English does not give rise to existential presupposition comes from the fact that there is a sharp difference between sentences with prosodic focus and clefts (Kadmon, 2000). Cleft sentences do trigger an existential presupposition. Moreover, clefts do not allow negative NPs in the clefted part, as shown in (59).¹⁶

¹⁵In Zubizarreta's account negative answers are treated as contrastive focus, which according to her "make statement about the truth or correctness of the assertion introduced by its context statement". Whether negative answers should be treated as an instance of contrastive focus is an issue that would require more extensive research than I can go into here. My assumption is that negative answers do not necessarily involve contrast and thus this treatment seems unsatisfactory.

¹⁶For additional arguments against the assumption that prosodic focus triggers an existential presupposition see Kadmon (2000).

- (59) a. MARY bought a new computer.
 b. It is MARY who bought a new computer.
 c. #It is NOBODY who bought a new computer.

Assuming the definite description (see (58b)) as the value of focus is also too strong, because it entails the uniqueness of the focus value, which is empirically inadequate for English focus (and for Serbo-Croatian as well). For example, an utterance of (59a) does not imply exhaustiveness of the focus. This utterance is quite compatible with a continuation such as (60).

- (60) JOHN bought a new computer too.

That means that the focus value in (59a) is not necessarily unique, as Zubizarreta's meaning, (58b), in the AS implies. There are languages for which this meaning of focus would be empirically adequate. For example, Hungarian is claimed to be such a language (Szabolcsi, 1981; Horvath, 1986; Kiss, 1995, among others). In Hungarian, the meaning of the prosodic focus includes exhaustivity entailment. It is claimed (Szabolcsi, 1981) that under negation it is the exhaustiveness entailment that is being negated, rather than the value of the focus itself. This is illustrated in (61). The sentence in (61a) in Hungarian does not express a contradiction even though the first conjunct negates a part of the second conjunct. A more accurate translation of the Hungarian sentence is not as in (61b), but rather the clefted version given in (61c). That is, ordinary (positional) focus in Hungarian is closer in meaning to the English cleft construction than to the English prosodic focus.

- (61) a. Nem JANOS kapott jalest.
 not Janos got A+
 hanem JANOS es MARI (kapott jalest)
 but Janos and Mari (got A+)
- b. #'Janos didn't get an A+, Janos and Mari did.'
- c. 'It's not that it was Janos who got an A+; it was Janos and Mari (who got an A+)'

Summarizing, I have shown that the assumptions about focus interpretation directly affect the set of possible focus domains. If focus is assumed to be interpreted at LF, then focus must correspond to a syntactic constituent. Restricting the choice of focus to syntactic constituents requires that focus be allowed to contain given information. This creates the need to be able to distinguish that part of focus which denotes given information. The distinction made between embedded F-markers and non-embedded F-markers in the SFPA is put to use for that purpose. Postulating a level of interpretation that is independent of LF would allow focus to be delineated along non-constituent lines. Two different theories opt for exactly that. However, I have pointed out that there are problems associated with these theories. Of the theories that assume LF interpretation of focus, I have shown that there are two types: the movement theory and the in-situ theory. I consider the problem with island constraints for the movement theory as a serious one and thus adopt the in-situ theory of focus interpretation.

2.5.4 Summary

In this section I have introduced the framework of Information Structure developed in Roberts (1996) for situating the investigation of focus in this dissertation. In this framework the question/answer congruence is defined in terms of an equivalence between the preferred meaning of the question, the Q-alternative set, and a part of the presupposed meaning of the assertion, its Focal-alternative set. This equivalence allows interlocutors to calculate the focus domain by accommodating implicit questions into the common ground, provided they bear on the explicit question under the discussion and function as a strategy in answering the accepted question.

2.6 Deaccenting

2.6.1 The Phenomenon

In this section I present a phenomenon known as “deaccenting” since Ladd (1980). Decaccenting is related to the concept of “given” information. The basic idea is that the constituent denoting given information must not bear accent, unless it is the focus of the utterance (van Deemter, 1994). Thus, even though *Max* denotes given information in (62a) (i.e., it is part of the QUD), it must bear the nuclear accent in the answer since it is the sole focus of that assertion.

- (62) a. Who did John insult when Max came in?
b. John insulted MAX.

If the default prominence within the focus domain falls on a constituent denoting given information, that constituent will not bear the accent, it will be "deaccented". The accent will fall on the element immediately to the left of it. Consider the following example (Ladd, 1996, p.176):

- (63) a. I'll have to buy a CIGARETTE. default prominence
 b. #If you don't give me a CIGARETTE, I'll have to buy a CIGARETTE.
 c. If you don't give me a CIGARETTE, I'll have to BUY a cigarette.

In (63a) the nuclear accent is on the direct object NP, *cigarette*. With this prominence, the focus can be projected up to the whole sentence, and is confirmed by the fact that the sentence can serve as an answer to the question "What will happen?" When the same sentence is the consequent clause of a conditional, preceded by the antecedent clause also containing the word *cigarette*, the second occurrence of the word *cigarette* must be deaccented, as the inappropriateness of (63c) shows. The acceptable pattern involves the placement of the nuclear accent on the verb. The idea behind deaccenting is that the information denoted by the word *cigarette* by the time it occurs the second time, is given, and hence must not bear prominence. Givenness of the information that the word *cigarette* denotes comes from the immediate linguistic context. However, that is not necessarily always the case. Consider the following example from Chapman (1998, p.49):

- (64) a. I wonder whether Shakespeare enjoyed SKATING.
 b. I wonder whether Shakespeare ENJOYED writing.

In (64a) the nuclear accent falls on the expression *skating*. This accent placement is able to project focus up to the whole embedded sentence (and possibly further). It would be fair to say that this is the default prominence for signalling focus of the embedded sentence. Apparently, with respect to focus, (64b) is interpreted in the same way as (64a). However, in (64b), the nuclear accent is on the verb rather than its complement *writing*. In (64b), the complement of the verb is deaccented and the accent falls immediately to the left of it, onto the verb.

It is assumed that the reason for deaccenting in this example lies in the fact the NP *writing* counts as given information and hence cannot bear accent, whereas the NP *skating* counts as new information. The question that needs to be answered is: What counts as given information as opposed to new information? For most scholars, information in the prior linguistic context counts as given information, as shown in (63). The point of the contrast in (64) is that, as Chapman argues, in this case, the given/new distinction has nothing to do with the linguistic context but rather with the encyclopedic knowledge about the world (knowledge that Shakespeare was a writer, in this case).

2.6.2 “Given/New” Distinction

Selkirk (1995, p.556) claims that the F-marking proposed in the SFPA does more than calculate focus domains, it also provides the “information structure” of the sentence. This is because in this system the presence vs. absence of embedded F-markers plays a role in encoding “new” vs. “given” information in discourse. However, Selkirk does not provide a definition of these two properties.

There seem to be several senses of "given/new" in the literature that play a role in the semantics of natural language. In defining the meaning of definite and indefinite noun phrases, Heim (1982) invokes a distinction which she calls familiarity vs. novelty. In her system an entity is familiar if it is part of the domain of discourse referents. Since the domain of discourse is part of the common ground, this sense of givenness pertains to givenness with respect to the common ground.

Prince (1992) proposes a taxonomy for the informational status of referential expressions that are relevant to formal encoding of entities referred to in discourse. Prince's taxonomy of informational status of an entity is based on two criteria: an informational status with respect to a hearer (hearer-old, hearer-new), and an informational status with respect to a discourse (discourse-old, discourse-new). The crossproduct of these two criteria produces three types of entities in the information structure: (i) brand new (discourse-new/hearer-new), (ii) unused (discourse new/hearer-old), (iii) evoked (discourse-old/hearer-old). The fourth possibility, discourse-old/hearer-new, is technically impossible (although surely familiar to anyone who has had a non-attentive interlocutor).

Another sense of "given" has been offered in Culicover and Rochemont (1983) and Rochemont (1986). They propose a notion called "c-construable" (or context construable). An expression can be either directly or indirectly c-construable. It is directly c-construable if it has a salient antecedent in discourse; and it is indirectly c-construable if the expression belongs to a class of scene setters (either by belonging to this class by definition or through pragmatic inferencing).

Centering Theory of Grosz and Sidner (1986) also provides a notion of givenness that pertains to relative salience of discourse referents. This notion of givenness is claimed to

be relevant for pronominalization and hence is important in computational algorithms for the resolution of pronominal reference.

What all of these sense of givenness have in common is that they relate to the range of phenomena relevant for signalling attention in discourse: the use of definite vs. indefinite descriptions, the use of definite descriptions vs. pronouns, and the placement of accent vs. absence of accent.

Do any of the already proposed senses of givenness seem to be related to Selkirk's intended notion? Schwarzschild (1999) proposes the following notion of givenness designed to capture the basic intuition behind this term relevant to focus.

(65) **Givenness** (to be revised)

An utterance is given iff it is entailed by prior discourse.

However, there is a problem with the definition in (65). Because it is based on entailment, it can only account for utterances of a propositional type. This is unsatisfactory, because expressions of other types also participate in this relation. For this reason, Schwarzschild proposes an operation called "Existential type shifting". This operation allows that a mention of a phrase such as "green apple" entails the proposition that a green apple exists, as represented in (66b). This proposition entails the existence of an apple, (66c), which in turn licenses givenness of *apple*. Givenness of *apple* precludes the accent placement on *apple* when (66d) follows (66a).

(66) a. I ate a green APPLE.

b. $\exists x[\text{green} - \text{apple}(x)]$

c. $\exists x\{\text{apple}(x)\}$

d. I also ate a RED apple.

Taking into account that givenness is also dependent on factors such as salience, Schwarzschild adjusts the definition of givenness to the one in (67).

(67) **Givenness (revised)**

An utterance U counts as **given** iff it has a salient antecedent A and A entails U, modulo \exists -type shifting.

Schwarzschild argues that this notion of givenness is sufficient to account for accent placement in English. If his notion of givenness is correct, then the notion of givenness relevant for focus is closer to the notion of givenness relevant for pronominalization, as proposed by Centering theory, i.e., givenness in terms of salience, rather than to givenness in terms of common ground, the notion relevant for marking definiteness. We turn to his theory of givenness and focus projection in the next section.

2.6.3 Schwarzschild (1999)

Schwarzschild (1999) points out that in certain cases focus projection rules such as those proposed in Selkirk (1995) make the wrong prediction with respect to (semantic) focus. Consider the following example from Schwarzschild (1999):

- (68) a. John drove Mary's red convertible. What did he drive before that?
b. He drove her BLUE convertible.

According to the focus projection rules, the nuclear accent on *blue* can only project as far as the adjective node itself and no further. Thus the focus structure after all focus projections rules have applied is as specified in (69):

(69) He drove her _F[BLUE] convertible.

The focus structure that we are expecting, given the question under discussion is the following.

(70) He drove _F[her _F[BLUE] convertible]

But the structure in (70) is illegitimate, given our projection rules, since there is no provision in the SFPA for adjuncts to project F-marking (see (21)). The accent on the modifier cannot F-mark the head noun and hence the phrase as a whole cannot be F-marked either.

Because of examples like these, Schwarzschild argues that we have to abandon the focus projection algorithm in favor of syntactically unconstrained distribution of F-markings. He argues that F-marking is constrained instead by a set of violable and ranked non-syntactic constraints. The constraints he proposes are the following:

(71) Schwarzschild (1999, p.173) Constraints on F-marking

- a. **GIVENness**: A constituent that is not F-marked is GIVEN.
- b. **AvoidF**: Do not F mark.
- c. **FOC**: A Foc-marked phrase contains an accent.
- d. **HeadArg**: A head is less prominent than its internal argument.

By the definition of givenness in (67) and the economy principle associated with the AvoidF constraint, Schwarzschild argues that the correct distribution of accents and F-markers is obtained. However, his argument based on the economy principle is stipulated and cannot be assumed to follow from the AvoidF constraint.

In trying to argue that AvoidF picks out the correct representation, Schwarzschild offers the contrast in representation of F-markers shown in (72).

(72) Context: {Jack said the American President drinks. What did Gilles say?}

a. He [said the [FRENCH]_F President drinks]_F

b. He said [the [FRENCH]_F President drinks]_F

For the above example Schwarzschild says: "AvoidF presumably chooses (72b) as the representation of the utterance in this context, since in that case the least material is covered by an F-marker" (p. 168). It is not clear how AvoidF can bear on the size of the focused material, when it only counts F-markers and chooses the representation with the fewest F-markers, not the one that covers the fewest nodes in a tree, as the comparison of (72a) and (72b) would imply.

The set of constraints designed to guide the distribution of F-markers seem to range from cognitive (such as GIVENNESS) to syntactic, such as HeadArg, to the interface condition, such as FOC, to the economy conditions, such as AvoidF. Why should these constraints be ranked with respect to one another, given their lack of cohesiveness? Secondly, this theory makes a prediction that another language may choose to rank the constraints differently, or even choose not to F-mark at all (this would happen if AvoidF were the highest ranked of all). But this does not seem to be the case. We seem to be pretty confident that

every language marks focus in some way, either prosodically, morphologically, or syntactically, and perhaps most often, some combination of these three. The assumption is that no matter what type of signalling the language has, the F-marking is present in the syntax. In that sense, focus marking is a language universal. So, if the ranking between GIVENness and AvoidF is fixed crosslinguistically, then the theory does not make any predictions, and is only encoding the facts.

How persuasive is Schwarzschild's argument that GIVENness affects accent placement? Terken and Hirschberg (1994) argue that givenness, as defined by contextual mention or entailment, is not a good predictor of deaccenting. They show experimentally that there is a high correlation of grammatical function and surface position of an element on the one hand and deaccenting on the other. That is, syntactic expressions tend to be deaccented if across utterances they bear the same grammatical function and/or surface position. Thus, a given element tends not to be deaccented if there is a grammatical function change between utterances/sentences. This point can be illustrated by the following example from Williams (1982).

- (73) a. Did you give the gun to George?
b. No. I LIKE George, but I certainly wouldn't give
1. GEORGE a gun.
 2. #a gun to GEORGE.

The difference in acceptability of the examples b1. and b2. in (73) shows that accent placement does not pertain to the informational status of the word that bears the accent,

since the NP *George* is accented in both examples, but rather to the surface position of this NP (and possibly grammatical function), as Terken and Hirschberg (1994) argue. Williams (1982) proposes the Rhyming Law, shown in (74), in order to account for cases of phonological identity like these. Since Schwarzschild's definition is purely truth-conditional, it is not clear how it can distinguish these examples.

(74) **The Rhyming Law:**

The final nucleus of an intonation unit (roughly, clause) cannot be identical to any final portion of the preceding intonation unit. Williams (1982, p.13)

Furthermore, despite its intuitive appeal, Schwarzschild's theory does not account for one of the classical examples of deaccenting, noted in Ladd (1980), shown in (75).

(75) a. Has John read *Slaughterhouse Five*?

b. No, John doesn't READ books.

According to Ladd, *books* is deaccented because the mention of a particular book invokes the concept of book and hence renders accenting *books* less accentable. According to Schwarzschild's theory, the mention of the *Slaughterhouse Five* allows for the Existential F-closure of *Slaughterhouse Five* to entail the existence of a book, and therefore *books* counts as given in the context. However, Schwarzschild's mechanism predicts that *read* is also given in the context, and thus predicts that *read* should also be deaccented. Consequently, Schwarzschild's theory predicts that (76) is the optimal accent placement.

(76) No, John DOESN'T read books.

The only non-given element in the answer to the question in (75a) is the negation, and hence the accent ought to be placed on the auxiliary-negation complex.

As we have already seen in Williams' "gun" example, accent placement does not seem to be constrained by givenness. That is, not all constituents that can be interpreted as given must be deaccented. Even in the context of (75a), the NP *books* can bear accent. In fact, the following three possibilities are all viable.

- (77) a. Has John read *Slaughterhouse Five*?
b. No, John doesn't READ books.
c. No, John DOESN'T read books.
d. No, John doesn't read BOOKS.

The three possible answers in (77) have slightly different interpretations. That is, each answer in (77), due to the accent placement, invokes a different set of assumptions. For example, (77a) seems to invoke the assumption that the speaker who asked the question about John having read *Slaughterhouse Five* had taken for granted that what John does with books is read them, and then explicitly denies this presupposition. (77b) seems to invoke the assumption that the speaker A had taken for granted the proposition that John reads books, and then explicitly denies it. (77c) is an utterance trying to convey disagreements with the presupposition that books are among John's reading materials. What the possibilities in (77) show us is that deaccenting is related to signalling presuppositions and is thus not exclusively governed by givenness as defined by Selkirk.

Moreover, given that Schwarzschild's theory is a semantic theory of prominence-focus relation, it makes a prediction that languages will universally avoid prominence placement

on elements that are given in the context. This prediction, however, is false. Ladd (1996) cites languages that strongly resist deaccenting of given material. Spanish, Romanian, and Italian, are such languages. For example, Ladd quotes the following example from Italian that shows that Italian does not have the rule of deaccenting.

- (78) Le inchieste servono a mettere a POSTO
the investigations serve to put to place
cose andate fuori POSTO
things gone out.of place

‘The investigations serve to put things into place that have gone out of place.’

As capitalization indicates, the prominence in the relative clause falls on the element that is given in the matrix clause. If we compare this sentence to English, we see that English strongly prefers the deaccented version. Consider (79).

- (79) a. The investigations serve to put things into PLACE that have gone OUT of place.
b. #The investigations serve to put things into PLACE that have gone out of PLACE.

If we were to account for the Italian example by ranking GIVENness lower than AvoidF, we would predict that Italian would strive to avoid accent altogether, contrary to fact.

Moreover, the notion of givenness relevant to accent placement and deaccenting does not always seem to rely on the semantic antecedent, as we have already seen in (64). In addition, in some cases a phonological antecedent is sufficient. Consider the following examples:

- (80) a. Last year John was dating Jane SMITH. This year he is dating TRACY Smith.

- b. Last year John was dating Jane SMITH. This year he is dating Jane W Smith.
[with prominence on "W"]

In neither of the examples in (80) does semantic entailment between the two referring expressions in the object position hold. That is, the existence of Jane Smith does not entail the existence of Tracy Smith, or Jane W. Smith. Thus, the notion of givenness as proposed by Schwarzschild does not seem to be able to predict the deaccenting of the phrase *Smith* in the second sentence. A similar example, pertaining to phonological identity, is noted in Williams (1997). Williams notes that uttering telephone numbers obeys a similar constraint on deaccenting as well:

- (81) a. nine two FOUR—one two three SEVEN
b. nine two FOUR—SIX four,TWOfour
c. # nine two FOUR—SIXfour,TWO eight

To sum up: Schwarzschild's theory is designed to rely on pragmatic computation of focus domain, and for accent placement on the informational status of the accentable words. However, as I have shown, the predictions it makes are not empirically justified. In addition, the theory itself can be criticized for the lack of cohesiveness of constraints and a lack of crosslinguistic generality despite its potential for accounting for different crosslinguistic patterns in term of constraint reordering.

2.6.4 Deaccenting within a VP

As we said earlier, questions that elicit VP-focus are of the type "What did X do?" For a VP to be focused Selkirk argues that at least one constituent in the core VP (the part of

the VP that includes the internal arguments but excludes the external argument) must bear nuclear accent. She argues that which constituent bears an accent, however, will depend on the information present in the relevant context. Consider (82).

(82) She sent her SKETCHES to the publisher.

What is the focus of (82)? Without a prior context, we would be inclined to say that the focus is either *her sketches* or *sketches*. In other words, the question that (82) is answering is “What did she send to the publisher?” or “Which of her things did she send to the publisher?” However, Selkirk argues that (82) can have a VP focus. Consider the following scenario.

(83) A: What's Mary been doing lately?

B1: Last month, she sent her manuscript to the PUBLISHER.

B2: This month, she sent her SKETCHES to the publisher.

According to Selkirk, B2 in (83) in the given context has a VP as the focus domain and is therefore answering the question in A: “What did Mary do?”. The SFPA accounts for the VP focus by allowing the F-marking of the internal argument, *sketches*, to F-mark the verb and subsequently the verb phrase. The second internal argument does not bear prosodic prominence because it is given in the context and is hence not F-marked. This is fine according to the SFPA as long as the internal argument is given. Therefore, according to Selkirk's analysis, the focus domain in B2 is the VP, but the accent is on the direct object internal argument because the other internal argument denotes given information.

Crucially, B2 cannot be interpreted as a VP focus without the context of B1 in (83). In defense of such accent patterns Selkirk says:

“Actually, the need to construct such an elaborate discourse to show VP focus has nothing to do with the focus rule, only with the fact that circumstances in which a noun phrase [...] may be appropriately focused and represented as new information are harder to construct.” (Selkirk, 1984, p.216)

I think there is a problem here. The fact that we must have a prior utterance of a certain type is a sign that the sentence in question is not felicitous as a direct answer to A's question. Instead, the indispensable intervening context is indispensable precisely because it sets up a different QUD. The following utterance is felicitous because it answers this revised QUD and not A.

In the framework of Information Structure, adopted here, we can say that (83) is shifting the topic of conversation from “What did Mary do?” to “What did Mary send to the publisher this month?”, the implicit QUD B2 in (83) is answering. In that sense, the focus is really not on VP anymore but only on the direct object. The context has been updated by the first utterance which has allowed the shift to an implicit QUD. In fact, what this seems to show is that more elaborate contexts assume implicit QUDs and that is why they allow/require shift in prominence.

What can we say about “given/new” distinction in this framework? The notion of “given” pertains to the (implicit) QUD. We have seen that implicit QUDs guide the discourse by setting up the strategies in answering the explicit questions. By choosing an implicit question as a sub-question of the explicit question the speaker shows how much of the common ground has been taken for granted, i.e. what he/she assumes to be given. The implicit question, of course, will only be adopted by the hearer if it is related to the explicit question by a sub-question relation, as in (83). As the discourse progresses we signal the

continuous update by reducing the focus domain. This is done by acknowledging the information in common. Williams (1997) incorporates this fact of human linguistic behavior into an account of deaccenting involving the following principle:

(84) **Don't Overlook Anaphoric Possibilities:**

Opportunities to anaphorize text must be seized.

2.6.5 Types of Deaccenting

We have said that the deaccenting is a phenomenon involving given information. However, we have also shown that the notion of "given" is elusive and that it is hard to find a definition that would predict when deaccenting is possible and when it is absolutely necessary. The reason for this, I believe, is the fact that examples of deaccenting do not constitute a homogeneous class. In some cases deaccenting is obligatory, as in Ladd's *cigarette* example, (63), and in others it seems optional, as in Ladd's *Slaughterhouse Five* example, (77).

For example, deaccenting is obligatory when used to signal coreference, as in (85), or type-identity, as in Ladd's *cigarette*-example.

(85) Rochemont (1986)

- a. Mary invited John_i to the party.
- b. #Oh, really? I thought she had invited the chairman_i of the BOARD.
- c. Oh, really? I THOUGHT she had invited the chairman_i of the board.

In comparison to Ladd's *cigarette*-example, which seems obligatory, deaccenting in the similar syntactic construction in (86), seems optional. Even though the antecedent of the conditional mentions books, the word *book* in the consequent can be deaccented but it need not be. However, this optionality is an illusion. Depending on the accent, each sentence in (86) signals a different context of use. For example, (86a) may be more appropriate after (87a), and (86b) after (87b). But in each of these contexts, only one of the accenting types is possible. Thus, the optionality is really an illusion, present only before we commit to a context of use.

- (86) a. If John likes BOOKS so much, why don't you BUY him a book.
b. If John likes BOOKS so much, why don't you buy him a BOOK?

- (87) a. Do you have anything against acquiring a home library?
b. What am I going to buy John for his birthday?

Deaccenting also seems to be sensitive to what Bolinger calls "semantic weight", which seems to be related to some notion of redundancy. Examples of this kind of deaccenting are given in (88), (89), and (90). For example the reasoning behind these examples is that the use of the word "plant" is redundant in the presence of "geranium", the use of the word "man" or "woman" is redundant in reporting a killing or a rape, since otherwise they would not be newsworthy.

- (88) a. ?My geranium PLANT died.
b. My GERANIUM plant died.

- (89) a. What did he do?
b. ?He has killed a MAN.
c. He has KILLED a man.

- (90) a. What did he do?
b. ?He has raped a WOMAN.
c. He has RAPED a woman.

Another type of deaccenting pertains to elements that cannot function as focus exponents (projectors of focus) when accented. Indefinite quantificational pronouns belong to this category. Consider the following example.

- (91) a. What did he do?
b. #He bought SOMETHING.
c. He BOUGHT something.

It is possible that the phenomenon illustrated in (91) is related to semantic weight. The act of buying entails the existence of the bought object. In the absence of a more informative description of the bought object, the indefinite quantificational pronoun does not carry sufficient "semantic weight", i.e., it is redundant to the information already provided by the verb.

To sum up: Deaccenting is a pervasive phenomenon in English. Most accounts of English deaccenting assume that givenness of the information denoted by the constituent is what drives the absence of accentuation. I have shown that this accounts for some cases

of deaccenting but not all. For example, a definition of givenness such as Schwarzschild's, which is based on the entailment relation, is not able to account for cases of deaccenting where mere phonological identity causes deaccenting. I have also shown that certain types of deaccenting should not be treated as deaccenting but rather as an instance of a smaller focus domain, Selkirk's *publisher* example, for instance. Schwarzschild's *convertible* example can also be explained by making reference to an implicit QUD, as a strategy of answering an implicit sub-question and obeying William's principle of anaphorizing the text. Descriptively, deaccenting seems to be used for several different functions: (i) signalling coreference, (ii) phonological identity – (the Rhyming Law of Williams (1982)), (iii) signalling presupposition (dis)agreement, (iv) semantic weight. There are probably more distinctions that can be made, but what is important here is to note that deaccenting is not a unified phenomenon.

The notion of deaccenting in English is relevant to this study because Serbo-Croatian has analogs to English deaccenting. As we will see in chapter 5, Serbo-Croatian has a similar transference of default prosodic prominence to the constituent immediately to the left, but it also has syntactic means for avoiding prominence: scrambling.

2.7 Summary

In this chapter we have looked at how prominence and focus are related. I have presented arguments in favor of a one-to-many relation between prominence and focus. This data is known as "focus projection". I have discussed Selkirk's (1995) algorithm for focus projection and shown its advantages, but also problems that have been noted in the literature.

I have shown that an adequate theory of focus must be at least partly pragmatic, since focus is disambiguated only in a larger context which incorporates discourse and other non-linguistic information. For this reason, I have placed the investigation of focus in a theory of Information Structure (Roberts, 1996), which allows immediate (on-line) update of information including interlocutors accommodation of implicit questions that serve as strategies in answering explicit questions. The remainder of this dissertation will assume this model when looking at the data in Serbo-Croatian.

CHAPTER 3

PHONOLOGY OF SERBO-CROATIAN INTONATION

The purpose of this chapter is to give an overview of Standard Serbo-Croatian intonation. The language that I intend to cover in this dissertation is the Štokavian–Ekavski variant ¹ of the Standard Serbo-Croatian. The analysis presented here is a broad outline investigation rather than a detailed statistical analysis, such as Lehiste and Ivić (1986).

Understanding focus projection in any language presupposes understanding the prosodic properties related to signalling prominence. From a prosodic point of view, Serbo-Croatian is different from an English-type language in a number of respects. However, there are many important analogues in Serbo-Croatian to the phenomena of focus projection from nuclear accents. It is important to understand the intonational phonology of the language to state the analogies precisely.

One of my goals in this chapter is to provide an analysis for (and thus place on some theoretical level) the intuition expressed in Popović (1997) but also in Barić et al. (1990, p.392) that “[In Serbo-Croatian] the first and the last position in a sentence are the most salient.” (my translation). It is not explicit what is meant by “position” in this statement,

¹ Serbo-Croatian dialects are divided along two parameters: (a) the first parameter is the word for ‘what’, thus we have *šta*, *čta*, and *kaj* and the corresponding dialects: Štokavian, Čakavian, and Kajkavian; (b) the second parameter is the reflex of the Common Slavic vowel *ja*. There are three reflexes of this vowel: [e], [i], and [ije]. Hence the corresponding dialects: Ekavski, Ikvavski, and Ijekavski.

but it seems that it is equated with the morphosyntactic word. In the analysis below, for a word to be the first or the last in the syntactic string of an utterance means that it coincides with an edge of a phonological unit that we will call an intonational phrase.

Phrases are units that are grouped together for some purpose. I will present evidence for two levels of prosodic grouping:

- **phonological word** (domain for clitic attachment) – groups syllables around a single culminative point (the pitch accent) and is delineated by a word boundary tone.
- **intonational phrase** (domain of local pitch range manipulation) – groups phonological words into a single domain by organizing each succeeding H tone of the lexical accent into a predictably lower pitch range, and is governed by a set of phrase level tones (phrase accents).

These prosodic groupings in Serbo-Croatian are supported by tonal evidence at their respective edges. Phonological words are separated by a L tone, and intonational phrases are marked by a phrase accent. The tonal markings of the intonational phrase signal prominence relevant for focus and focus projection. Thus, Serbo-Croatian differs from English in the inventory and type of prosodic units, and tonal markings relevant for focus. The important result of this chapter is showing that despite these differences between the two languages, we can establish that the analogue of the nuclear pitch accent (prosodic prominence relevant for semantic focus in English) is a phrase accent in Serbo-Croatian. This analogy is relevant for chapter 5 where we will be examining hypotheses proposed for accounting for focus projection that are based on pitch accents as prosodic markers of focus.

3.1 Methodological Preliminaries

The results presented in this chapter is based on an instrumental investigation of F_0 contours for close to 300 utterance types, ranging from citation form utterances of single words to three-sentence paragraphs uttered by nine native speakers of Standard Serbo-Croatian. The intention is to provide a wide coverage of Serbo-Croatian utterance types in order to get an overview of the complete system, as a framework for investigating some specific aspect of the system in a thorough quantitative analysis with careful control of interaction with other sources of systematic variation. This purpose is a result of the need for the more overall picture of the system prior to the later quantitative modelling of specific questions. This is in line with the work done by Pierrehumbert (1980) which provided the groundwork of a complete description of the English intonational system, which subsequently resulted in the detailed study of pitch range in (Lieberman and Pierrehumbert, 1984). Consequently, claims presented here will be more qualitative than quantitative.

All the material uttered by the author was digitally recorded directly into a Sun workstation (Sun4) or Linux box and analyzed using the Entropics Waves program. Materials uttered by the other eight native speakers were recorded in a quiet room on a Marantz tape recorder and then digitized with Waves using a Denon tape player and the Sun workstation. Four of the speakers, including the author, are from Novi Sad, three of the speakers are from Belgrade, one of them is from Kruševac, and one of them is from Valjevo.

For the purposes of getting an uninterrupted pitch track, almost all of the words and sentences recorded were chosen for their all-sonorant quality. Some exceptions were made when the length or the late position of the accent of the word was crucial in investigating

a certain hypothesis and no word with all sonorants was found with those characteristics. Also, as it was important to look at minimal pairs and words with particular syntactic and semantic properties (notably, *wh*-words) it was necessary to include some words that do not have all-sonorant quality.

To keep the speaker pitch range constant, I show only utterances performed by myself. The decision is a consequence of the fact that it was not possible to get all the relevant data from all the speakers. However, none of the pitch tracks used here for the purpose of illustration are isolated tokens of the type. Pitch tracks were used as evidence only when the same contour occurred constantly across at least five tokens of the same type of utterance.

3.2 Framework: Intonational Phonology

I provide an analysis of Serbo-Croatian intonation within the framework of Intonational Phonology (see Ladd, 1996). One of the main assumptions within this framework is that the tune is independent of the text and that there are certain regularities that govern the alignment of the two. Another important assumption in this framework is that higher level prosodic domains are defined tonally. Thus, evidence for prosodic constituents above the morpheme will be gathered from the inspection of the F_0 (fundamental frequency). This framework differs from a related framework of Prosodic Phonology (see Nespor and Vogel, 1986) where the main evidence for prosodic constituents comes from juncture effects at the segmental level. It has been shown that in Korean (Jun, 1996) and Bengali (Hayes and Lahiri, 1991) the two types of domains may coincide. However, I provide no segmental

evidence for the prosodic domains proposed here. Moreover, I do not assume that the two types of prosodic domains are isomorphic to one another (see the argument against isomorphic relationship for English in Gussenhoven (1990)). Hence, my proposal regarding the prosodic constituency of Serbo-Croatian does not make any claims about the prosodic domains relevant for phonological operations involving segments.

3.2.1 Tune and Text

Following analyses of English (Pierrehumbert, 1980; Beckman and Pierrehumbert, 1986) I assume that a tune is a particular sequence of tones, high (H) and low (L), whereas the text is a segmental string under a particular syntactic analysis. The tune and the text are independent of each other, although they are related through constraints on alignment. Thus, the same tune can be aligned with many different texts and the same text can be aligned with many different tunes. Some examples from English are given in (92).

- (92) a. Your word is your word.
 H H L L
 b. Anna married Lenny.
 H H L L
 c. Anna married Lenny.
 H L L

We see that in (92a) and (92b) we have the same tune (the same sequence of tones) but a different text. In (92b) and (92c), we have the same text but a different tune. The corresponding pitch tracks are shown in Figures 3.1, 3.2, and 3.3.

The pitch tracks in Figures 3.1 and 3.2 have the same tune and they differ from the tune shown by the pitch track in figure 3.3.

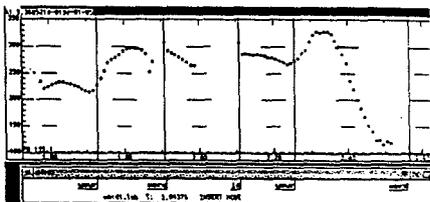


Figure 3.1: A pitch track corresponding to (92a): "Your word is your word."

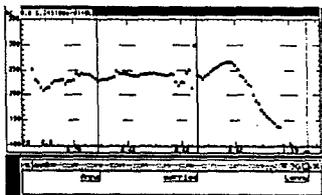


Figure 3.2: A pitch track corresponding to (92b): "Anna married Lenny."

3.2.2 The Structure of the Tune

The tones in (92) do not all have the same status. The string of tones that we call a tune is structured, just as the text is. That is, the tones are grouped into different categories. In English, the tones can belong to any of three different categories: pitch accents, phrase accents, and boundary tones.

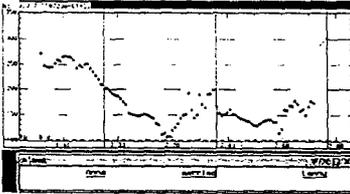


Figure 3.3: A pitch track corresponding to (92c): "Anna married Lenny."

In English, a pitch accents can be simple (a single tone, H* or L*) or complex (a bitonal pitch accent, H*+L, L*+H, or L+H*). The basic characteristic of pitch accents is that they are aligned with respect to the stressed syllable in a word. A boundary tone aligns to the final edge of an intonational phrase, a prosodic constituent that corresponds to a sense unit, according to Selkirk (1984) (but see Taglicht, 1998). A phrase accent marks an intermediate phrase (a prosodic constituent just below the intonational phrase) and it aligns both to the last accented word and the final edge of its phrase. The convention, after Pierrehumbert (1980), is to mark the tone of a pitch accent aligned with the stressed syllable with a " * " after the tone, a complex pitch accent indicates with " + " between the two tones, a phrase accent with " - " after the tone, and a boundary tone, with a " % ". Thus a more structured analysis of the tunes that we represented in (92) would mark them in the following way, shown in (93).

- (93) a. Your word is your word.
 H* H* L-L%

- b. Anna married Lenny.
H* H* L-L%
- c. Anna married Lenny.
H* L* H-H%

3.2.3 Tune and Text Alignment

The general rules of alignment of the tune with the text for English are the following:

- (94) a. pitch accents align with the primary stressed syllable of a word, unless a syllable is promoted to this status by focus
- b. phrase accents are carried by the syllables following the nuclear stressed syllable in the phrase
- c. boundary tones align with the last syllable of the phrase

There is some inadequacy with the way the alignment rules are stated in (94). The problem with (94a) is that a word with a stressed syllable before the primary stress can have pitch accents on more than one syllable. Also, there can be a pitch accent only on the first stressed syllable if the word doesn't bear the nuclear accent. For example:

- (95) Shuttuck-Hufnagel et al. (1994)
 - a. Massachusetts !?
L*+H L*+H L-H%
 - b. Massachusetts miracle .
L*+H L*+H L-L%

For the phrasal accents and the boundary tones, the problem consists of the fact that these tones are a property of higher order prosodic constituents, rather than syllables. Phonetically, they get realized on the syllables themselves but phonologically they are not properties of syllables but rather of abstract phonological constituents, an intermediate phrase.

or an intonational phrase. Only pitch accents are aligned to syllables at the phonological level.

With these caveats, we can assume the rules on text-tune alignment in English to be as stated in (94). In the following sections we examine Serbo-Croatian intonational system assuming the same framework just outlined for English.

3.3 Sentential Tones in Serbo-Croatian

Traditional grammars of Serbo-Croatian (Mrazović and Vukadinović (1990, *inter alia*), Barić et al. (1990), Stevanović (1989)) but also scholars of the Slavic languages from the Prague School (Sgall et al., 1986) recognize two types of intonational patterns within the Slavic languages. They refer to one as “neutral”, and the other as “emotive”. In the system proposed here, the two patterns are defined in terms of prosodic phrasing and the alignment of the phrasal tones with respect to the text. But before we can give a theoretical account for these intuitions, we need to describe the inventory of the intonational lexicon of Serbo-Croatian.

In this and following sections we will decompose the tune in Serbo-Croatian into its component parts, analogous to the way the tune in English was decomposed by Pierrehumbert and Beckman. The rules for tune-text alignment, in this autosegmental/metrical analysis of English intonation, refer to metrically prominent positions, such as stressed syllables. In addition to being a pitch accent language, Serbo-Croatian is also a stress language. Therefore, before we analyze the intonational patterns of Serbo-Croatian, we need to introduce the basics of Serbo-Croatian stress.

3.3.1 Stress

Word stress in Serbo-Croatian polysyllabic words is variable: it can be found on any syllable except the final. The position of the stress is not predictable (but see Inkelas and Zec, 1988). This means that the stress must be specified in the lexicon. Consequently, for the word stress we have to acknowledge the following:

(96) Word Stress: lexically specified.

For the phrasal stress, I adopt the following two-part rule:

- (97) a. Within a phrase with neutral intonation pattern, the right-most word is the strongest.
b. Within a phrase, with a marked (the so-called "emotive" (see Sgall et al., 1986)) intonation pattern, the focused word is the strongest.

3.3.2 Pitch Accents

Standard Serbo-Croatian (SC) is a lexical pitch-accent language. That is, words are specified not just for the location of stress, but also for the shape of the pitch accent that is aligned to the stressed syllable.² All previous analyses (Browne and McCawley (1965).

²A new division within the standard seems to be emerging: Smiljanić and Hualde (2000) report that lexical pitch accents are lost in the speech of some speakers of the western variant spoken around Zagreb. This trend for some speakers around Zagreb has already been noted in Magner and Matejka (1971), where they note a great geographic variability in preservation of accentual distinctions claimed for the Standard varieties. To what extent this is a property of the entire Croatian variant of the language is hard to say at this point, but it seems certain that the lexical distinctions among pitch accents are being obliterated among a certain percentage of this population. If this trend continues and spreads through the entire western variant of Serbo-Croatian, it will be necessary to distinguish the Serbian and the Croatian standard variants along the lexical pitch accent line.

Inkelas and Zec (1988), Kostić (1983), Lehiste and Ivić (1963, 1986), Nikolić (1970), Stevanović (1989), Gvozdanović (1980), inter alia) recognize four different types of pitch accents: short and long falling and short and long rising. The traditional way of marking accents is the following diacritics over the stressed vowel: [~] for the short falling, [^] for the long falling, [`] for the short rising, and [ˆ] for the long rising.

The melodic part of the accent can be specified as a sequence of two tones. The falling accents can be characterized as a melody consisting of a sequence of a high (H) tone and a low (L) tone. The rising accents can be characterized as a melody consisting of a L tone followed by a H tone.³ Both melodies are anchored to the tone bearing unit, a mora of the stressed syllable (Zec, 1994). These accents are lexically contrastive, and hence, they are phonemic.

The distribution of the accents is sensitive to the melody of the accents: the falling accents can occur only on the words with the stress on the first syllable, the rising accents can occur on words that have the stress on any syllable but the last. This effectively reduces the distribution of the rising accents to polysyllabic words. That is, only the falling accents can occur on monosyllables, since they are not restricted from the last syllable. Because the falling accents almost never occur on any other syllable but the first⁴, the falling/rising opposition is possible only in domains where the two accents overlap in distribution: polysyllabic words with the stress on the first syllable. According to all of the

³In the analysis presented by Inkelas and Zec (1988), rising accents are treated as a sequence of two H tones, i.e., HH.

⁴There are few exceptions involving short-falling accents on non-initial syllable in compounds, such as *poljoprivreda* 'agriculture'.

previous analyses, the pitch accents in Serbo-Croatian are a property of the tone bearing unit: a mora of the stressed syllable. Only content words bear pitch accents. Function words, such as prepositions, conjunctions, verbal auxiliaries, and pronominal clitics, bear no stress or pitch accent.

A schematic representation of the accent shapes in sentence-medial position can be found in Figures 3.4 – 3.7.

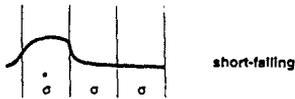


Figure 3.4: An abstract representation of a sentence medial word under the short-falling accent.



Figure 3.5: An abstract representation of a sentence medial word under the long-falling accent.

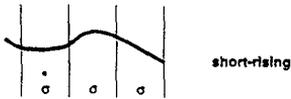


Figure 3.6: An abstract representation of a sentence medial word under the short-rising accent.

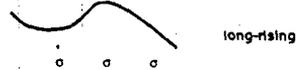


Figure 3.7: An abstract representation of a sentence medial word under the long-rising accent.

Extracted F_0 shapes of actual utterances of words with falling accents from a sentence medial position are shown in Figures 3.8 – 3.11.



Figure 3.8: An F_0 contour of a sentence medial token of the word under the short falling accent *jãlov* 'fruitless'.



Figure 3.9: An F_0 contour of a sentence medial token of the word under the long falling accent *jãvan* 'public'.

The F_0 contour of the falling accents clearly shows a rise to a certain level and a subsequent fall. The target for the level is a H tone and the subsequent fall of the F_0 is a fall to the target L. The next two figures, Figures 3.10 and 3.11, illustrate the two rising accents, again in a sentence medial position.

For the purpose of describing the intonation contour we can reduce the division of the accents from four to only two distinct types: the falling accents versus the rising accents. The division of accents into short versus long refers to the duration of the stressed syllable



Figure 3.10: An F_0 contour of a sentence medial token of the word under the short rising accent *mālina* 'raspberry'.



Figure 3.11: An F_0 contour of a sentence medial token of the word under the long rising accent *linija* 'line'.

with which the accent is associated. This contrast can be represented at the segmental level by marking the phonemic duration of the vowel or the syllabic [r] and therefore does not have to be encoded as a different type of accent. In this chapter, I will not be so concerned with justifying an analysis of lexical pitch accents, but for detailed argumentation see Godjevac (2000). We will represent the two accent types as H^*+L (falling) and L^*+H (rising) as proposed in Godjevac (2000).⁵ The pitch accents associate with the stressed syllable of a word, as they do in English. However, this association between the stressed syllable and the accent is lexical, rather than post-lexical.

⁵Inkelas and Zec (1988) argue for a different analysis of the rising pitch accents. They propose that the rising accents be represented as a sequence of two H tones. However, a quantitative study of H tone alignment in the four accents types, supporting the analysis of Godjevac (2000), can be found in Smijanić and Hualde (2000).

As a result of the lexical status of pitch accents, alignment of the intonational tune with the text does not make reference to the pitch accents, since they are already aligned with the text through lexical specification. For our purposes then, it will be sufficient to note that every content word is inherently associated with either a rising or a falling pitch accent. Consequently, every tune in Serbo-Croatian will be partly composed of the lexical pitch accents for the string of words in the text. For the most part, the questions relevant for the analysis of Serbo-Croatian intonation are the following: (i) What are the intonational means for signalling pragmatic information? and (ii) Do components of sentential tune that are pragmatically relevant affect the lexical pitch accents, and if so how?

We will see that the pragmatic information is conveyed through other means than pitch accent assignment, such as prosodic phrasing, and the choice of phrase accents. Intonational tones, such as phrase accents and word boundary tones interact with the lexical pitch accents to produce shapes unique to the combination.

The standard measure of the shape of the lexical pitch accents is often the medial position in a broad focus sentence. This is because we can assume that in this position, the lexical pitch accents are unaffected by intonational tones. As a result, studying the effects of the intonational tones on pitch accents is done as a comparison to their shapes in broad focus medial position. Using this standard of comparison, we find that different phrase accents affect the lexical pitch accents of the words that realize them to a different degree. The degree to which a lexical pitch accent is affected by a phrase accent depends on the alignment properties of the phrase accent. For example, if a phrase accent alignment is specified with respect to the stressed syllable, then since the lexical pitch accent is also

aligned in this way, the melodic properties of the phrase accent override those of the lexical accent so that the F_0 does not show the rising vs. falling specification of the underlying lexical pitch accent.

However, even when the phrase accent obliterates the shape of the pitch accent, in many cases the contrastive lexical specification can be recovered from the distributional properties of the lexical pitch accents. That is, we know that words with the stress on a non-initial syllable always bear a rising pitch accent and that monosyllabic words always bear a falling accent. Consequently, in none of these words does the phrase accent affect the information about which lexical pitch accent a word bears, whatever the manipulation of the F_0 . This is because the information about which pitch accent the word bears is deducible from the distributional properties of the accent and the length of the stressed syllable.

However, in polysyllabic words with the stress on the first syllable, the distributional properties of the lexical pitch accent cannot provide any clues about the lexical pitch accent because this is where the distribution of the accents intersect. Thus, this is the set of environments that are relevant for answering the second question in order to see whether intonational tunes neutralize the pitch accent distinction. By looking at these types of words under different phrase accents, we find that under some phrase accents lexical pitch accents are neutralized, and under others, the alignment of phrase accents are different for falling vs. rising accents and consequently the lexical pitch accents are still recoverable in the acoustic signal.

In the next sections, we look at the tones that we find at edges of intonational units that we will call phrase accents and word boundary tones. We examine their basic F_0 shapes and their effect on the lexical pitch accents.

3.3.3 Intonational Tones

There are five basic F_0 shapes that characterize Serbo-Croatian intonational tunes. We find (i) **fall**: pitch range compression and floor lowering; (ii) **rise**: pitch range compression and raising of the floor; (iii) **fall-rise** a pitch fall followed by a rise and pitch range compression; (iv) **rise-fall**: pitch rise followed by a subsequent partial-fall; and (v) **fall-rise-fall** pitch fall followed by a rise, followed by a fall. All of them, except the fall-rise-fall, occur at the final edge of a prosodic unit corresponding to a syntactic phrase or a sentence. These shapes are schematically represented as realized over a 3-syllable word with a stress on the first syllable in Figures 3.12 through 3.27.

Figures 3.12–3.13 show schematic drawings of the fall, and Figures 3.15–3.14 show actual examples of F_0 contours. In the representations I include two different realizations of the fall, according to the lexical pitch-accent type of the word that realizes the fall. This is because the fall differs depending on the lexical pitch-accent. When the fall is realized over a trisyllabic word that bears a falling accent, the pitch fall of the lexical accent is exaggerated and continues onto the phrase edge where modal voice gives way to laryngealized. (Laryngealization is a low pitch common to final falling intonation.) Note that in Figure 3.14 vocalization seen in the wave form continued past the point where the pitch extraction algorithm gives up. The wave form shows the irregular (laryngealized) pulses whereas the pitch track is empty. By contrast, when the fall is realized over a trisyllabic

word that bears a rising accent, the pitch stays level during the stressed syllable and the post-stressed syllables. Despite the clear differentiation of the falls between the two accent types, this is a realization of the same edge tone effect. The effect is a sharp lowering of the pitch range, which exaggerates the fall after the falling accent but flattens out the rise of the rising accent.

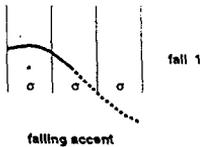


Figure 3.12: An abstract representation of a fall over a word with a lexically specified falling accent.

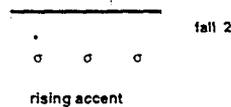


Figure 3.13: An abstract representation of a fall over a word with a lexically specified rising accent.

Figures 3.16–3.19 show an abstract representation of the two different types of rises: the simple rise and the fall-rise; Figures 3.20 and 3.21 show actual F_0 contours of these patterns.

The two types of rises differ in the way they affect the lexical pitch accents. They differ in the timing of the rise. In the simple rise, the rise starts within the stressed syllable

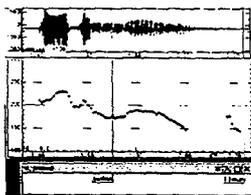


Figure 3.14: An illustration of a fall over a short-falling accent in a declarative sentence *Jedem limun.* 'I am eating a/the lemon.'

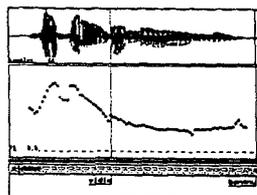


Figure 3.15: An illustration of a fall over a long-rising accent in a declarative sentence *Vidim bananu.* 'I see a/the banana.'

reaching its peak in the stressed syllable of the words with falling accents and in the post-stressed syllable of the words with rising accents. In the fall-rise phrase accent, the rise does not start until immediately after the stressed syllable regardless of the lexical pitch accent the word is inherently specified for, and the peak is reached on the final syllable. Words with the falling vs. rising lexical pitch accents realize the simple rise differently and hence the lexical pitch accents are preserved under the rise. The fall-rise, on the other hand, entirely obliterates the lexical pitch accents.

The simple rise can occur on sentence non-final constituents as well as sentence final constituents, signalling continuation, whereas the fall-rise is found on sentence final constituents only. The fall-rise signals the meaning of an incredulity question (as discussed for English by Ward and Hirschberg, 1988), and is the so-called "prompting intonation" in Inkelas and Zec (1988), or the "reverse pattern" of Lehiste and Ivić (1986).

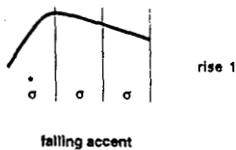


Figure 3.16: An abstract representation of a rise on a word with the lexical falling accent.

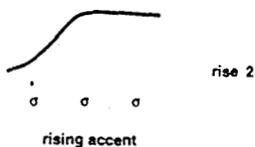


Figure 3.17: An abstract representation of a rise on a word with the lexical rising accent.

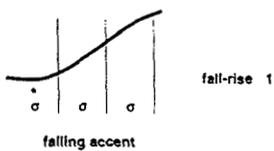


Figure 3.18: An abstract representation of a rise on a word with the lexical falling accent.

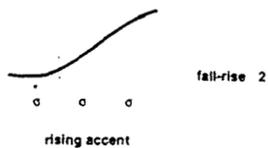


Figure 3.19: An abstract representation of a rise on a word with the lexical rising accent.

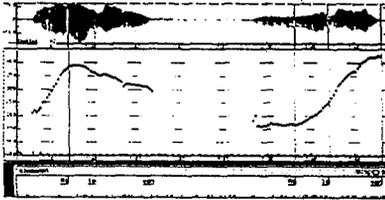


Figure 3.20: On the left is an example of the rise over the word with the short falling accent on the first syllable, *Milovan*, and on the right is an example of the fall-rise over the same word.

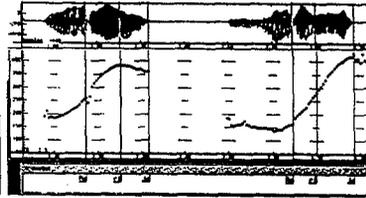


Figure 3.21: On the left is an example of the rise over the word with the short rising accent on the first syllable *Marija*, and on the right is an example of the fall-rise over the same word.

In addition to the simple rise and the fall-rise, there is a rise-fall shape as well. Figures 3.22, 3.23, 3.24 show the rise-fall pattern. The rise-fall is a tune used for a vocative chant, and as a result seems highly specialized. However, this contour also occurs in playful exchanges. For example, it can be found on *wh*-questions, as in *Ko je?* 'Who is it?' after a knock on the door; and also in contexts of teasing or as gentle reminders.

Regardless of the length of the word, the HL sequence always occurs two syllables from the utterance's final edge. This is illustrated in Figure 3.25, using a seven-syllable word with the stress on the fifth syllable.

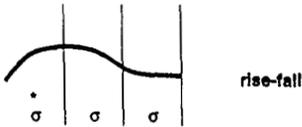


Figure 3.22: An abstract representation of a rise-fall.

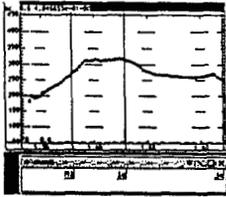


Figure 3.23: An F_0 track of a rise-fall, used for vocative chants. The pitch track represents a chant of *Miloje*, a word with a falling accent on the first syllable.

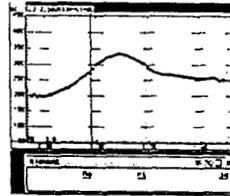


Figure 3.24: An F_0 track of a rise-fall, used for vocative chants. The pitch track represents a chant of *Marija*, a word with a rising accent on the first syllable.

Another shape that we find correlating with pragmatic information is the fall-rise-fall. Figures 3.26–3.27 show the fall-rise-fall. The fall-rise-fall is a tune that occurs in yes-no questions. This particular contour is always placed on the focused word rather than at the edge of the intonational phrase.

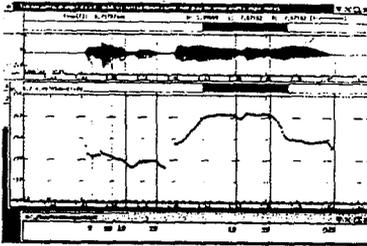


Figure 3.25: An F_0 track showing a rise-fall on a seven syllable word with the stress on the fifth syllable and a rising accent. Gloss: *omalovažavanje* 'humiliation'

In broad-focus yes-no questions (i.e., questions which are targeting the polarity of the whole sentence) this prominence falls on the main verb. In narrow focus yes-no question (i.e., questions which are questioning the truth of the denotation of a particular constituent in the sentence) the prominence can fall on any constituent. In figure 3.28, the prominence falls on *menažerija*, 'menagerie', and the utterance is interpreted as a narrow focus utterance on that word. Although, this tonal pattern overrides the lexical tone shape, it aligns with the focused word in such a way that allows differentiation of the lexical pitch accents: on a word with a rising accent, the peak aligns later than on a word with a falling accent. This difference in alignment is represented in Figures 3.26 and 3.27. An F_0 track of this contour is provided in figure 3.28.

In this section we have seen that the shapes of the simple intonational tones, the fall and the rise, differ according to the lexical pitch accent of the word that realizes them.

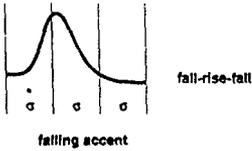


Figure 3.26: A stylized contour of the (LHL)- phrase accent for the falling accent.

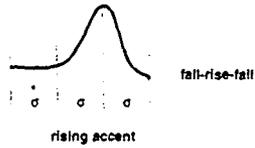


Figure 3.27: A stylized contour of the (LHL)- phrase accent for the rising accent.



Figure 3.28: An F_0 track showing a fall-rise-fall. Gloss: *Njegova menažerija ima puno mana?* 'Is it his MENAGERIE that has many flaws?'

However, the shapes of complex intonational tones, the fall-rise, the rise-fall, and the fall-rise-fall, is not affected by the lexical pitch accent. Of the three complex intonational tones, the fall-rise and the rise-fall neutralize the lexical pitch accents, whereas the fall-rise-fall does not, since its alignment properties differ according to the lexical pitch accent and hence it preserves the contrast between the lexical accents.

3.3.4 Categorization of Intonational Tones

What kind of an analysis of the intonational tones can we provide? That is, what is category of tones do they belong?

In the previous section, we have seen that there are five basic types of tunes: the fall, the rise, the fall-rise, the rise-fall, and the fall-rise-fall. We can tentatively think of their pragmatic force as declarative, continuation, incredulity question, vocative, and yes-no question, respectively. *Prima facie*, we can characterize these tunes as follows: the fall can be characterized as a simple L edge tone, the rise as a simple H edge tone, the fall-rise as a bitonal, LH, edge sequence, the rise-fall as a HL bitonal edge sequence, and the fall-rise-fall as a tritonal sequence LHL.

On the basis of a qualitative examination of the data, my proposal is that all of these F_0 shapes can be analyzed as phrase accents. There are two types of corroborating evidence for this hypothesis. First, in neutral prominence patterns, edge tones always occurs on the final content word in the intonational phrase, whereas in "emotive" intonational patterns this type of tonal prominence is always associated with an element of the focus. Given that, as we will see in Chapter 5 that in neutral intonation pattern, the final content word is also part of the focus, these tones are associated with the focus in both intonational patterns. Second, in the case of the LH and the LHL sequences, we find secondary association to the stressed syllable, and this property has been found to correlate with a phrase accent (see Grice et al., in press).

The first type of evidence shows that these tonal sequences are related to sentence stress. In neutral intonation patterns, sentence stress is right-most, whereas in non-neutral

patterns, the sentence stress can occur on any element in the sentence as long as it is a part of focus. We will see in Chapter 5 that in neutral intonation patterns, the final constituent is always interpreted as focused or as a part of the focus of the sentence. Thus, given that these tone sequences are always associated with the sentence stress on the one hand and focus on the other, it seems reasonable to treat them as phrase accents. For a language that employs pitch-accents for the purpose of lexical differentiation, it seems natural to assume that other means in the tonal inventory would take over the function of signalling focus, since pitch-accents serve a different function, a function of lexical differentiation, and are thus unavailable for signalling pragmatic information. Crosslinguistically, we find this type of designation of the functional load to be quite common. We find it in Swedish (Bruce, 1977), in the Venlo dialect of Dutch (Gussenhoven and van der Vliet, 1999), and in Japanese (Venditti, 2000). All three languages employ pitch accents for the purpose of lexical differentiation, and the focus-signalling intonational functions associated with pitch accents in English are taken up by phrase accents (Swedish), boundary tones (Venlo Dutch), or phrasing and pitch range (Japanese).

In Serbo-Croatian sentence-broad focus utterances, the prominence is always associated with the right-most element in the phrase. This suggests that Serbo-Croatian intonational phrase is right-dominant, i.e., at the higher levels of prosodic structure, the strongest element is at the end of the phrase. A prosodic correlate of the phrasal stress is the so-called final lengthening, for which there is instrumental evidence in Lehiste and Ivić (1986). Here I am proposing that we have another prosodic correlate of phrasal stress: a phrase accent. That is, phrasal stress is accompanied by tonal manipulations in addition to lengthening.

What is the difference between neutral and non-neutral prosodic prominence? I will illustrate this property by showing two declarative utterances of the same sentence: one uttered as a sentence broad focus (i.e., as an answer to a question such as “What happened?” or “What’s new?”, etc.), Figure 3.29, and other as a narrow focus on the second word in the utterance, Figure 3.30. Declaratives are always associated with a L edge tone.

In the broad focus utterance, Figure 3.29, the phrasal stress is right-most and so is the phrase accent. In the narrow focus utterance of the same sentence, the phrase stress and the phrase accent are associated with the focus of the sentence. In this case, the phrase *žena* ‘wife’. In the narrow focus utterance, Figure 3.30, where the focused constituent occurs early in the sentence, the prosodic effects of the phrase accent are pitch range compression immediately after the phrase accent placement.

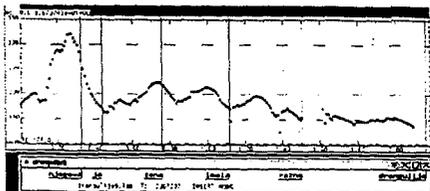


Figure 3.29: An example of a L- phrase accent at the end of the sentence in the declarative sentence *Njegova je žena imala razne drangulije* ‘His wife had all sorts of junk’ with neutral prominence.

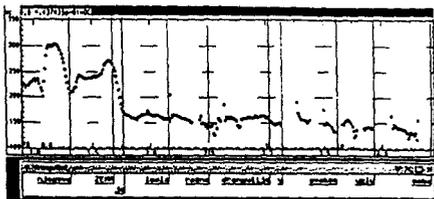


Figure 3.30: An example of a L- phrase accent at the end of a focused constituent in declarative sentence *Njegova ŽENA je imala razne drangulije u svakom uglu sobe*. 'His wife had all sorts of junk in every corner of the room' with a focus on *žena* 'wife'.

In Figure 3.30, the L tone is associated with the right edge of the prosodically prominent word, *žena* 'wife', which we will call focally prominent. As a result of this placement of the phrasal stress and the choice of the L tone, the pitch range of the following text is drastically reduced. That is, the phonetic interpretation of the phrasal L tone is that it compresses the pitch range of the following text by lowering the ceiling of the tonal space. This pitch range manipulation of the L- phrase accent can be schematically represented as shown in Figure 3.31.

The nature of the phrase accents in English is to some extent analogous. The tone of the phrase accent is "a tone that fills the space after the last pitch accent in a phrase" (Pierrehumbert and Beckman, 1988, pg. 256). The parallel is in the interpolation between the L target and the end of the phrase. The difference is that in Serbo-Croatian the phrasal L tone manipulates the pitch range through the association with the higher level constituent and is



Figure 3.31: Schematic representation of the effect of the L- phrase accent on the pitch range.

not really an interpolation between the last pitch accent and the boundary tone. The lexical pitch-accents are still realized in the post-focal material, except that the pitch range reduction directly affects their realization by decreasing their tonal space.

Analogously to the L- phrase accent, which lowers the ceiling of the pitch range, the H tone of the LH- phrase accent raises the floor of the pitch range to the end of the phrase, if there is any post-focal material. This can be seen in Figures 3.32 and 3.33. This property of the phrasal H tone is most prominent in the LH sequence because the simple rise only occurs on intonational phrase final words, whereas the LH- can also occur on a focused word of the final syntactic constituent (which itself need not be final in the intonational phrase).

We can represent the pitch range manipulation of the phrasal H tone as a raising of the floor of the tonal space, as shown in figure 3.34.

I have noted that the second type of evidence for these tones being phrase accents comes from the fact that we find clear secondary association of some of these tones to the stressed syllable of the focused word. This property of phrase accents is documented by

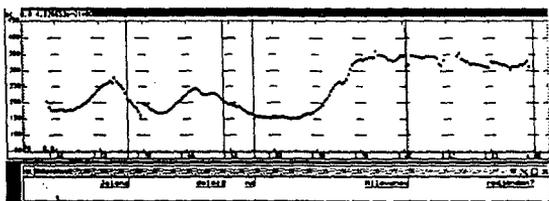


Figure 3.32: An example of a LH- phrase accent on the focused constituent in a syntactically unmarked question *Jelena dolazi na Milovanov rođendan?* 'Jelena is coming on MILOVAN'S birthday?' with a focus on *Milovanov* 'Milovan's', a word with a falling accent on the first syllable.

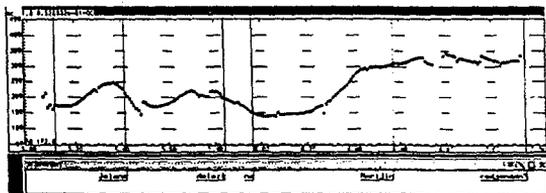


Figure 3.33: An example of a LH- phrase accent on the focused constituent in a syntactically unmarked question *Jelena dolazi na Marijin rođendan?* 'Jelena is coming on MARIJA'S birthday?' with a focus on *Marijin* 'Marija's', a word with a rising accent on the first syllable.

Grice et al. (in press) for Standard Greek, Standard Romanian, and Standard Hungarian. The tune described by Grice et al. (in press) is the same tune as the one we find in the LHL shapes of the focus in yes-no questions in Serbo-Croatian. Given the geographic proximity

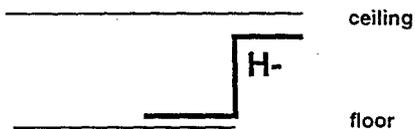


Figure 3.34: Schematic representation of the effect of the H tone of a phrase accent on the pitch range.

of these languages described in Grice et al. (in press) to Serbo-Croatian, it seems natural to attribute this property of the LH phrase accent in Serbo-Croatian to the areal influence.

To illustrate the secondary association with the stressed syllable of the L tone of the LH phrase accent, I provide two types of evidence: (i) the alignment of the L tone of this accent is the same for both falling and rising accents. That is, the L tone occurs on the stressed syllable of the rising accents overriding the H tone of the H*+L of the falling pitch accent; and (ii) I show that in polysyllabic words under rising accents where the stress position can vary, the L tone is always on the stressed syllable, whereas the H tone is associated with the final syllable. This type of evidence is unavailable for words under the falling accents because the falling accents are restricted to the initial syllables only.

The first type of evidence can be seen in Figures 3.32 and 3.33. The word *Milovanov* has the short falling accent on the first syllable, whereas the word *Marijin* has the short rising accent on the first syllable. These two words have the same F_0 shape even though they bear different pitch accent. Both portions of the F_0 contours corresponding to these words in Figures 3.32 and 3.33 show a dip around the stressed syllable of the word followed

by a rise. We interpret the dip as a realization of a L tone and the rise as a realization of a H tone. It is not surprising that the word with a rising accent has a L tone on the stressed syllable, since under this analysis that is the inherent property of the rising accents. But it is surprising that a word that bears a falling accent, which means that it would ordinarily have a H tone on the stressed syllable, realizes a L tone on this syllable. This L tone, however, is the property of the LH- phrase accent, and the H tone of the lexical pitch accent is not realized by the F_0 .

Figures 3.32 and 3.33 show us that this type of intonational marker, associated with a LH tonal sequence, affects the lexical prosodic properties of the focused word. The next figure, Figure 3.35, shows that this tonal marker always has a secondary association to the stressed syllable. Figure 3.35 shows pitch tracks of four utterances in which the position of the stressed syllable was varied from the first to the fourth syllable in a sequence of at least five-syllable words, occurring at the end of the phrase. These pitch tracks illustrate that the L tone always occurs on the stressed syllable, regardless of the length of the word, and the peak is always reached at the end of the word, just as in utterances shown in Figures 3.32 and 3.33. This evidence also argues in favor of the hypothesis that the H tone is associated with the last syllable of the focused word, and thus this is clearly an edge tone.

In Figure 3.35, we can observe that the F_0 does not start to rise until right after the stressed syllable. This is our evidence that the L tone of this phrase accent has a secondary association to the metrically strong syllable of the focused word. Because of this type of alignment, which is the same as for the lexical pitch accents (they also align with respect to the metrically strong position in the word), this bitonal sequence overrides the lexical pitch-accent. However, this neutralization of the falling/rising opposition occurs only on a subset

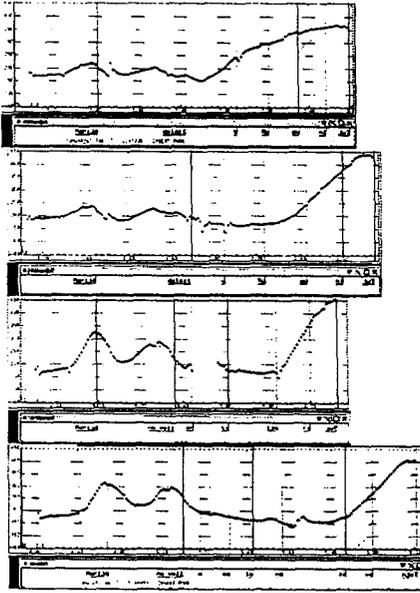


Figure 3.35: The four panels show a sequence of five or more syllable words at the right edge of the phrase. The words were chosen for varying position of the stress. In the top panel, the stress is on the first syllable of the prepositional phrase, i.e., the prepositions itself: *Marija dolazi U Rumuniju?* 'Mary is coming TO Romania?' In the second panel from the top, the stress is on the second syllable of the phrase: *Marija dolazi u RUMUNIJU?* 'Mary is coming to ROMANIA?' In the third panel, the stress is on the third syllable. *Marija ne voli ARTILJERIJU?* 'Mary doesn't like ARTILLERY?' In the bottom panel the stress is on the fourth syllable. *Marija ne voli OMALOVAŽAVANJE?* 'Mary doesn't like HUMILIATION?'

of the words that realize these accents. As we noted before, this is the set of words where the contrasts are manifested: polysyllabic words with the stress on the first syllable. When this phrase accent aligns to the metrically strong syllable of a word under a rising accent with non-initial stress, the information that this word bears a rising accent is retrievable from the position of the stress, since only rising accents are possible on non-initial stressed syllables.

I suggested that the phonological difference between a rise and a fall-rise intonation pattern can be represented as a difference in a tone sequence: a H vs. a LH tone sequence. F_0 contours of the two types of tunes show a rise. We represent the rise by a H tone. What is the evidence for a L tone in the tune with a fall-rise? It is the alignment facts of the two that show us that they are different. In the simple rise pattern, the plateau occurs already on the post-stressed syllable; whereas in the fall-rise pattern there is a more gradual rise which does not start until right after the stressed syllable. This difference in the path of the F_0 is interpreted in the following way: we hypothesize that the tune is a specification for tonal targets and the F_0 is a realization of interpolations between tonal targets. The gradual rise as opposed to a sharp rise is accounted for by postulating an additional tonal target, the L tone, which has a secondary association to the stressed syllable and prevents the interpolation to start earlier. The sharp rise, on the other hand is a realization of a single tonal target which does not have a secondary association to the stressed syllable. The F_0 thus reflects the interpolation between the lexical tones and this post-lexical tonal target.

To sum up: On the basis of tonal alignment with the phrasal stress and secondary association with the lexical stress I have argued that the intonational tones discussed in section 3.3.4 are phrase accents. In the next section we look at beginning edge tones.

3.3.5 Beginning Edge Tones

In addition to the intonational tones discussed in the two previous sections, we also find tonal markings at the beginning edges of morpho-syntactic units, such as words. I call these word-boundary tones. There are two types of word-boundary tones: L and H. The L word-boundary tone occurs in broad focus utterances, whereas the H word-boundary tone marks the prosodic constituent containing the narrowly focused word in a double focus construction. In this section I discuss only the L word boundary tone, and postpone the discussion of the H word boundary tone to section 3.5.1.

Evidence for the left edge L word-boundary tone comes from instrumental data which show a consistent presence of a dip in the F_0 contour between two adjacent accented words, the first of which is a disyllabic word under a rising accent and the second a word under a falling accent (see Figures 3.36 and 3.37, which contrast predictions of an earlier autosegmental account by Inkelas and Zec (1988)). If the tonal sequence of words with these two lexical pitch accents consisted exclusively of the tones which are property of the lexical pitch accents then it would be hard to account for the F_0 dip found in these sequences. I propose that the dip corresponds to a post-lexical tonal target at the word boundary. The possibility that we have a sagging interpolation between the two H tones, as suggested for English in Pierrehumbert (1980) seems unlikely because the two tone targets are adjacent, unlike in English where the two tone targets can be separated by intervening syllables.

For the purpose of testing the prediction of the theory of sentential tones presented in Inkelas and Zec (1988), I have constructed three types of examples: (a) a sequence of a noun subject and a verb (since SC is an SVO language, this sequence does not involve any

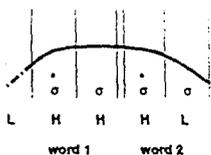


Figure 3.36: An abstract representation of the F_0 contour predicted by the theory of Inkelas and Zec (1988).

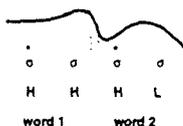


Figure 3.37: An abstract representation of the F_0 contour found in the configuration: a word under a rising accent followed by a word under a falling accent.

type of pragmatic highlighting via word order); (b) a sequence of a noun subject and an adverb, another canonical structure; and (c) a sequence of an adjective and a noun, i.e. a modified NP in a subject position. These three constructions are used in order to show that the dip is not due to differences in phrasing correlating with a particular syntactic construction such as topicalization or scrambling. All of the three types of constituents occur at the beginning of a sentence since the pitch range in this position is the widest and hence tonal properties are more salient on the pitch tracks.

Figures 3.38, 3.39, and 3.40 show the pitch tracks of two consecutive words of this type. They all reveal that an additional L tone is present between the two disyllabic words, first with a rising and the second with a falling accent. This is unexpected in the theory of Inkelas and Zec (1988) which assumes that a sentential tune (up to the final edge) consists only of a sequence of tones corresponding to lexical pitch accents.

In all three pitch tracks (Figures 3.38 – 3.40), the first word is disyllabic and has a long rising accent on the first syllable and the second word has a long falling accent on the

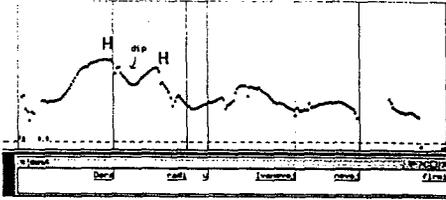


Figure 3.38: Noun-verb sequence. The sentence is *Dara radi u Ivanovoj novoj firmi.* 'Dara works in Ivanov's new company.'

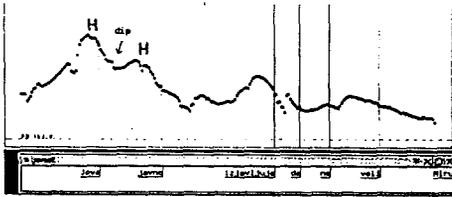


Figure 3.39: Noun-adverb sequence. The sentence is *Jova javno izjavljuje da ne voli Miru.* 'Jova publically claims that he doesn't like Mira.'

first syllable. Since the first word is disyllabic, we know that the H tone will be realized on the second (i.e. final) syllable, since this is the intrinsic property of the rising accents (see Lehiste and Ivić, 1986; Inkelas and Zec, 1988; Godjevac, 2000; Smiljanić and Hualde, 2000). The second word, having the falling accent on the first syllable must exhibit a H tone on the first syllable, again due to the inherent properties of the falling accent. If there were no word boundary tones, simple concatenation of these two words should produce a

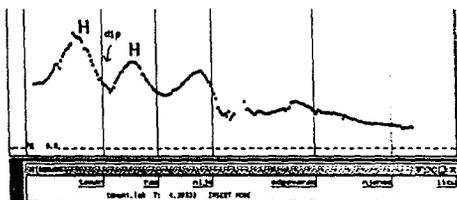


Figure 3.40: Adjective-noun sequence. The sentence is *Táman rám nije odgvarao njenom licu.* 'A dark frame didn't suit her face.'

steady pitch line representing the two H tones, one from the final syllable of the first word and one from the initial syllable of the second word, as in shown in Figure 3.36. However, as we see in Figures 3.38 – 3.40, the two H tones are separated by a dip in pitch, as shown in Figure 3.37. This dip consistently shows up around the beginning of the first syllable of the second word. Consequently, I take this intervening valley to be the evidence for the L word boundary tone (to be represented as %L).

We find the presence of the L word boundary tone fairly consistently. However, there are contexts in which they seem to be missing. These contexts involve function words with rising accents, such as the demonstrative pronoun *ona* 'that.fem.sg' followed by a word under a falling accent, and in phrases which have become a common sequence, such as *hvala lepo* 'thank you'. It is conceivable that these realizations are due to merging of the two words into a single prosodic unit. In addition, the presence of the L word boundary tone is dubious in compressed pitch range, such as those followed by an early phrase accent. It seems reasonable to assume that the absence of a word boundary tone

is evidence of “dephrasing”. (The concept of “dephrasing” is familiar from literature on Korean (see Jun, 1996) and Japanese (see Pierrehumbert and Beckman, 1988) and is used to denote the loss of prosodic boundaries due to focus.) However, it is very hard to make firm conclusions regarding the L word boundary tone in compressed pitch range without a thorough experimental study and quantitative analysis of the data.

In the next section I discuss prosodic structure of Serbo-Croatian, based on intonational tones discussed in previous sections.

3.4 Prosodic Constituents

Serbo-Croatian edge tones provides tonal evidence for two types of prosodic constituents: the intonational phrase, and the phonological word (also known as the accentual unit in traditional grammars (see Mrazović and Vukadinović, 1990; Barić et al., 1990)). In this section we look in more detail at the properties of these two constituents.

3.4.1 Intonational Phrase

Two major properties evident of this prosodic constituent are the final edge tones, discussed in 3.3.3, and pitch range manipulation, to be discussed here. The final edge tones are often used as a probe for this level of prosodic structure. We have already seen that Serbo-Croatian has two simple tones, L and H, and three complex tones, LH, HL, and LHL, that mark this prosodic unit. In addition to the final edge tones, this constituent functions

as a domain of pitch range manipulation. To look at pitch range manipulation in Serbo-Croatian, we can measure the starred tone of the falling accent, H*, or trailing H of the rising accent on words in different positions within the phrase.

We confine our study to broad focus declarative utterances only, and consequently to intonational phrases marked by a L- phrase accent. This is because pitch range manipulation is the most perspicuous in this condition due to the phonetic realization of L- phrase accent, which affects the pitch range (by compressing it) at the final syllables of the intonational phrase in the neutral intonation pattern. The discussion of pitch range manipulation within an intonational phrase is divided into three parts. We first discuss edge positions: initial and final, and then the medial position.

3.4.1.1 Initial Position

Both the sentence initial position and the discourse initial position in an utterance have the highest H target of all the phonological words in a sentence. However, the two differ by the level of the H tone. The utterance initial H is higher than the sentence initial H. This position is set off from the rest of the words in the utterance by the relatively higher pitch target regardless of its syntactic status. That is, the H tone of the word is higher than the H in the second word regardless of whether the word is a syntactic unit by itself or a part of a larger phrase.

To illustrate this point, consider a more elaborate utterance consisting of three sentences, instead of just one, in figure 3.41. We can notice that the H in each subsequent sentence initial position is slightly lower than the preceding one. Thus, the absolute utterance-initial position is always set off from all the others by its highest H target. The pitch track in Figure 3.41 represents the following text:

- (98) a. Milovanova mama je žurila na voz.
 Milovan's mother aux hurried on train
 Milovan's mother was rushing to catch a train.
- b. Nije imala vremena da gleda ljude u prolazu,
 not.aux had time that look.at people in transit
 She didn't have the time to observe people around her,
- c. ali je njenu pažnju Marija ipak privukla.
 but aux her attention Mary still attracted
 but Mary still managed to attract her attention.

Each pair of adjacent sentences in the above sequence is separated by a short pause, yet their initial H targets create an internal slope thereby bringing cohesiveness to the whole utterance. The internal structure of the three sentence utterance is reminiscent of English utterances as documented by Lehiste (1975). Lehiste showed that, in English, paragraph utterances are characterized by a certain intonation structure, the so-called 'paragraph intonation'. The relationship between pitch range and discourse topic structure has also been suggested by Brown et al. (1980) and Hirschberg and Pierrehumbert (1986) for English, and by Gronnum (1985) for Danish.



Figure 3.41: Three consecutive sentences from example (98), showing the set off peaks of the initial constituents and scaling of the three peaks across discourse.

This property of the F_0 of Serbo-Croatian utterances confirms the claim quoted from a traditional grammar at the beginning of this chapter, that "the first and final positions are the most salient" Barić et al. (1990, pg. 392).

3.4.1.2 Final Position

We have already noted that the sentence final position in declarative utterances is also characterized by its distinctive intonational shape. Any type of a syntactic constituent with any type of a lexical pitch accent in a declarative sentence final position shows a highly reduced pitch range with the pitch very close to the speaker's base line. This effect is treated as final lowering in Inkelas and Zec (1988, pg.240) or laryngealization by Lehiste and Ivić (1986, pg.186). Lehiste and Ivić point out that the effects of laryngealization very often seem to lead to neutralization of the accents in a sentence final position. This lead Inkelas and Zec to posit the rule of final lowering, which stipulates the insertion of a L tone on the last syllable of the last word over-riding the H of the lexical accent (which in their

model is always an associated tone). This rule makes a prediction that accents in bisyllabic words are neutralized in sentence final position. The data that I have collected show that the distinctions among the word accents are still preserved (see Godjevac, 1999). Even though the distinctions between the lexical accents are reduced relative to the initial or medial positions in a sentence of this type, I argue that a phonological representation should not include a rule like Inkelas and Zec's final lowering. The phenomenon appears to be an effect of the L- phrase accent and of some aspect of backdrop pitch range, which Figure 3.41 shows can be varied in continuous but systematic way to gradiently signal position within the larger discourse.

The following two figures show the difference induced by the sentence position on the same words. In the first figure, Figure 3.42, we can see the word *mlàda* 'young' in the initial position, and the final position occupied by the other member of this minimal pair, the word *mlâda* 'bride'. In the second figure, Figure 3.43, the two words are in the reversed positions. This illustration allows us to see the difference between a falling accent and a rising accent in the sentence initial vs. final position.

From the two figures we can see that the rising accent stays level in the final position, whereas the falling accent is falling, and it actually becomes laryngealized, as already shown in section 3.3.3. Therefore, there is a clear differentiation between the two accents even in the sentence final position. The reduction of the pitch range did not erase the lexical tonal distinctions.⁶

⁶There is some additional evidence for the preservation of the falling/rising distinction. In her acquisition study of Serbo-Croatian accents, Kariya (1983, pg.60) notes that 'the distinction between rising and

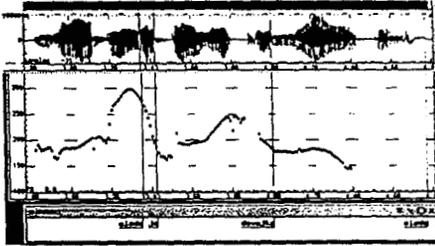


Figure 3.42: *Mlâda je devojka mlâda* 'A/The young girl is a/the bride.'

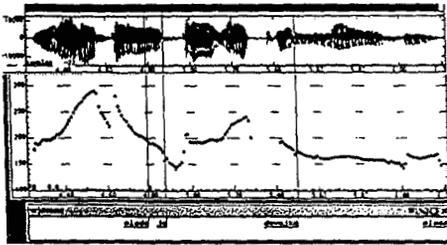


Figure 3.43: *Mlâda je devojka mlâda* 'A/The bride is a young girl.'

falling accents was evident from patterns of post-stressed syllable deletion: the vowel in a syllable immediately after a falling accent was much more likely to be whispered or deleted than the vowel in a syllable immediately after a rising accent.

The rule of final lowering of Inkelas and Zec is an insertion of a L tone on the final mora of an utterance to replace the lexical tone there. This rule predicts that the final syllable of *mláda* should be lower than the last mora of the first syllable, which would be assigned the lexical H. As we can see from the Figure 3.43, that prediction is not borne out.

Instead of positing a final L insertion rule, which effectively erases the lexical H, I posit a L– phrase accent. That is, declarative utterances are marked by a L– phrase accent. The phrase accent tone is a property of a higher level phonological constituent, the intonational phrase. The realization of this tone is manifested as lowering the ceiling of the pitch range at the edge of the constituent that carries the phrasal marking: the right-most constituent in neutral prosodic conditions, or whatever constituent is chosen in the case in “emotive” intonation patterns, as we will see in section 3.5.

The influence of the higher level tones on the peak in the final position (in neutral prosodic contexts) is even more perspicuous in longer utterances. Consider the following utterance consisting of five phonological words, i.e. 5 peaks.

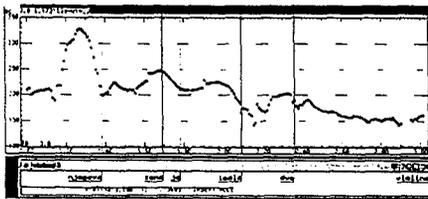


Figure 3.44: An utterance of five phonological words: *Njegova žena je imala dve violine* 'His wife had two violins.'

The height of the F_0 of the peak in the final position is lower than the proportional reduction based on the preceding peaks would have predicted. Schematically, we could represent this relationship in Figure 3.45.

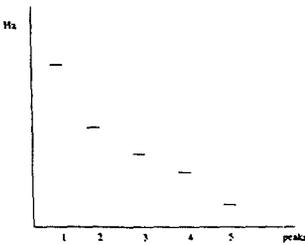


Figure 3.45: Schematic representation of the peak-proportions for an utterance of length 5 (phonological words)

The influence of the final position on the peak is to make the peak lower than it would have been if it were not in the final position. I claim that this is a direct consequence of the final L phrasal tone, i.e., L-phrase accent, associated with the intonational phrase.

Thus, what seemed like a conspiracy against lexical accents in final position is just a consequence of tonal marking of a higher level prosodic constituent. Lexical accents are still present in the final position, only their F_0 shapes are affected by the higher level tones. This analysis also predicts that the shorter the accented word in the final position, the more crowded the tones will be, and consequently the more difficult it would be to see them by

observing (measuring) the F_0 . In the previous accounts, such as the one of Inkelas and Zec (1988), which operated under the assumption that tones are only properties of syllables, the conclusion that the accents are neutralized in this position seemed inevitable.⁷

I conclude by observing that under the analysis presented here pitch range manipulation in the final position in declarative utterances is a direct consequence of a L- phrase accent. Therefore, no special account is needed for capturing the effect of final position on fundamental frequency.

3.4.1.3 Medial Position

The intonational phrase is also the domain of pitch range manipulation that is independent of effects associated with either the initial position or the final position. There are two related phenomena of this type: (i) a continuous downtrend and (ii) an interrupted downtrend.

A decline in the pitch level as a declarative utterance evolves seems to be a fairly common phenomenon crosslinguistically (Ladd, 1996, pg. 73). In prosodic broad focus (rightmost phrasal stress), declarative utterances in Serbo-Croatian exhibit a clear steady decline of the H tones associated with the lexical pitch accents. This downtrend is very obvious because each subsequent word (delineated by a L word boundary tone) has a H tone from its lexical pitch accent, and each of these peaks is lower than the preceding one. A typical effect we find in connection with downtrend in SC can be seen clearly in Figures 3.44 and 3.46. This trend has also been quantitatively documented by Lehiste and Ivić (1986).

⁷There is another piece of evidence that accents are not neutralized in the final position: they show up clearly when prosodically prominent. I will present this evidence in section 3.5, as a part of the discussion of "emotive" intonational patterns.

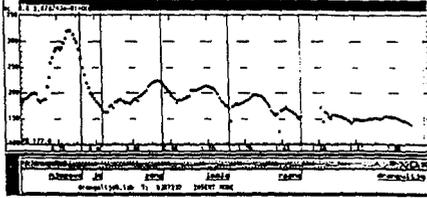


Figure 3.46: An F_0 track of the sentence *Njegova je žena imala razne drangulije* 'His wife had all sorts of junk.'

In order to observe downtrend independent of the edge effects we need to look at utterance medial positions. This means that we need to look at utterances such as the ones shown in Figures 3.44 and 3.46, which are long enough to examine downtrend over words other than the first and the final, because these are arguably affected by their special position in the utterance.

In Figure 3.46 we can notice that the peak (i.e. the lexical H tone, which is part of every phonological word whether it is a rising or a falling accent) of each of the words in the medial positions (the third, fourth, and fifth content word) is slightly lower than the peak of the preceding one. This downward "movement" of the F_0 measured at the same relevant points across words in medial positions shows that there is a clear effect of a continuous downtrend in this declarative utterance. I call this downtrend continuous because the downward movement of the F_0 , measured at the relevant points, is uninterrupted. However, the continuity of the downtrend is a function of the length of the utterance.

When an utterance is longer than five or six words, neutral intonation patterns always exhibit a non-continuous, i.e., interrupted, downtrend. I call this property of the Serbo-Croatian prosodic system a 'pleating effect'. To my knowledge, this was first discussed in Kostić (1983, pg. 61), who noticed that a sequence longer than five words must break up into "leveled" sequences of either two or three words, and this break is signaled by an upstep of the H in the following sequence. He calls it *nivelisanje* 'leveling' and uses representations shown in Figures 3.47 and 3.48.

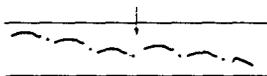


Figure 3.47: Kostić (1983) schematic representation of a possible break up of downstepping in an intonational phrase which contains more than five words into two units.

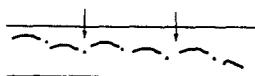


Figure 3.48: Kostić (1983) schematic representation of a possible break up of downstepping in an intonational phrase which contains more than five words into three units.

Basically, what we find is that the pitch range gets partially reset to a higher target at constituent boundaries as the utterance gets longer than five content words.⁸ This effect

⁸The partial reset of the declination was discussed in Ladd (1984, 1988); however the partial reset was a function of scope disambiguation between two conjunctions, 'and' and 'but'. The partial reset may have the same function in SC as well, but, it need not, as in the case I am presenting. It can simply be a function of the length.

has also been noted for Japanese by Kubozono (1992), which he called 'metrical boost'.

As he explains, the phenomenon:

'... can be understood [in such a way] that the downstepped phrase has been raised by the phonetic realization rule of metrical boost to such an extent that it is now realized higher than the [previous] phrase. This case is typical ... at major syntactic boundaries ...'

I will illustrate this phenomenon in SC by a series of three pitch tracks that represent a successive lengthening of a simple sentence. The three sentences are as follows:

- (99) a. Njegova žena je imala dve violine.
his.NOM wife.NOM AUX had two violins.ACC
'His wife had two violins.'
- b. Njegova žena je imala dve violine iz istog perioda.
his.NOM wife.NOM AUX had two violins.ACC from same period
'His wife had two violins from the same period.'
- c. Njegova žena iz prvog braka
his.NOM wife.NOM from first marriage
je imala dve violine iz istog perioda.
AUX had two violins.ACC from same period
'His wife from his first marriage had two violins from the same period.'

An actual utterance of the sentence from example (99a), represented in Figure 3.49, has no pleating effect, as the pitch track shows.

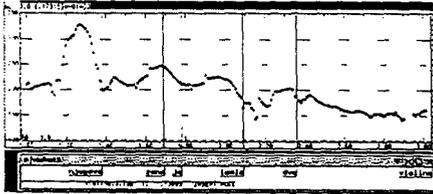


Figure 3.49: *Njegova žena je imala dve violine* 'His wife had two violins.'

We can see that the H targets get lower and lower in the utterance as we proceed from the beginning to the end. This downtrend can be treated as a downstepping sequence of the each subsequent H, modulo the initial peak, whose H target has to be accounted separately. The next two pitch tracks, Figures 3.50 and 3.51, are actual utterances of the lengthened versions of the sentence in (99a), i.e., (99b) and (99c). These utterances illustrate the 'pleating effect'. As the utterance gets longer, the downtrend cannot be continuous, but must be broken into several sequences. How many sequences we get depends on the length and the rate of speech. The 'pleating' breaks the sequence of the downtrend and introduces a new pitch range for the downtrend by locally upstepping certain peaks within the phrase.

An obvious question to consider is whether these upsteps mark a boundary of a certain prosodic constituent below the intonational phrase and above the phonological word. If so, we might expect this prosodic constituent to be sensitive to a type of a syntactic boundary (see Nespor and Vogel, 1986; Selkirk, 1986) and thus have a prediction where it might occur. However, the upstepping of the local pitch range in Figures 3.50, 3.51, and 3.52

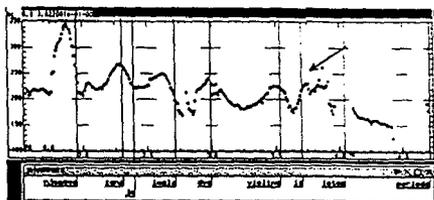


Figure 3.50: *Njegova žena je imala dve violine iz istog perioda* 'His wife had two violins from the same period.' Local pitch range resettings are marked with an arrow.

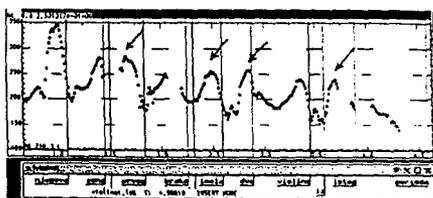


Figure 3.51: *Njegova žena iz prvog braka je imala dve violine iz istog perioda* 'His wife from his first marriage had two violins from the same period.' Local pitch range resettings are marked with an arrow.

is done at syntactic boundaries that do not make a natural class. In Figure 3.50, the reset is done at a boundary between a noun phrase and its PP modifier (adjunct). In Figure 3.51, there are four reset points: (i) at the same point as in Figure 3.50, (ii) at the point of a syntactic head/complement boundary (V and NP), (iii) at the point between the last constituent in the subject NP and the first constituent of the VP (i.e., the main verb), and

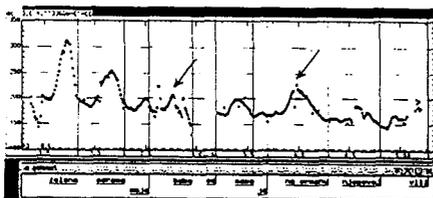


Figure 3.52: An F_0 contour of *Zelena marama moje babe od mame je na ormanu u njegovoj vili*. 'The green scarf of my mother's mother is on the cupboard in his villa.' Local pitch range resettings are marked with an arrow.

(iv) at the boundary between an NP and its PP modifier (the same boundary as in (i)). Thus the reset seems to occur at two basic types of syntactic boundaries: head/complement and head/modifier. Because syntactic boundary type does not affect reset points, I take it to be evidence that 'pleating' is not a function of the syntactic boundary type. As a result, I do not take pleating to be evidence for a different prosodic constituent.

The pitch range reset at each phrase is done in such a way that the level of the H tone is reset to the same level, or a slightly higher level than the preceding H tone, thereby breaking up the downstepping sequence. This is what creates the effect of 'pleating' of the F_0 . There is no global focal prominence on any of these constituents on which the H was reset. This type of effect on the downtrend is a function of the length, the rhythm and the speech rate of the utterance. In most of the cases of pleating I have seen, the reset occurs in utterances with six or more words. This is in accordance with the observation made by Kostić (1983). It is possible to find utterances longer than six phonological words with no

reset points in the downtrend; however, they are pragmatically marked. They can be found in reading styles of children's stories and fables, but in spoken language they often convey the speaker's attitude such as boredom or as a signal of repetition.

To sum up: Intonational phrase is a prosodic constituent defined by a phrase accent. In declarative utterances with a L- phrase accent, it functions as a domain of pitch range manipulation involving downtrend and a partial reset of the downtrend. We now turn to the prosodic constituent below the intonational phrase, the phonological word.

3.4.2 Phonological Word

This unit is defined by the presence of a lexical pitch-accent and either an initial %L or an initial %H word boundary tone.

A phonological word is not in one-to-one correspondence with a morpho-syntactic word. For example, a single morpho-syntactic unit may consist of more than one phonological word, and a single phonological word may contain more than one morpho-syntactic unit. The two utterances represented in Figures 3.53 contain the morpho-syntactic unit *belo-zeleni*, literally, 'white-green'. Syntactically this is a single unit, an adjectival modifier of the noun *tanjir* 'plate'. Morphologically, however, it is a compound. This complex morphological unit can be realized either as a single phonological word, as in the utterance on the left portion of the panel, or as two phonological words, as in the utterance on the right. The two prosodic realizations have a slight difference in meaning, as translations show. The single prosodic realization of this unit has the meaning 'whitish green', whereas

the two prosodic units have the meaning 'white and green'. The pitch accent in the single prosodic unit realization of this compound is on the second part of the compound, i.e. *zeleno*.⁹

How do we know that these two types of prosodic realizations of the *belo-zeleni* are realizations of the same morpho-syntactic unit and not two different morpho-syntactic units? That is, how do we know that in both types of prosodic realizations we are dealing with a compound? We know that in both cases it is a compound because the inflection occurs only at the end of the morpho-syntactic unit. If in the two prosodic unit realization, the first member of the compound actually functioned as a separate morpho-syntactic unit we would expect *belo* to agree with the nominal in number, gender, and case, which in this case would have to be *beli*.

The difference between the two prosodic realizations of *belo-zeleno*, in Figure 3.53, lies in the presence vs. absence of a pitch accent on *belo* and a %L boundary tone delineating the two pitch accents between *belo* and *zeleni*. In the left panel in Figure 3.53, *belo-zeleni* is uttered as a single phonological word: there is only one accent, on the first syllable of the second member of the compound, i.e., *-ze-*. Hence, the phonological word is defined by the tonal properties rather than morphosyntactically.

⁹We cannot conclude from this example that in compounds in general the pitch accent falls on the second member of the compound, because there are compounds in which the accent is on the first member, such as *Stáři-grád* (name of a place from the words *stáři* 'old' and *grád* 'city'), or *vódovod* 'water supply, plumbing' (from *vôda*, 'water' and *vôdi* 'leads'), etc. The accent placement in compounds seems fairly complex and I do not intend to provide an account for them.

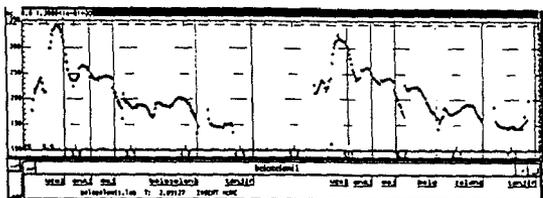


Figure 3.53: An F_0 track of the sentences *Uzmi onaj moj belozeleni tanjir.* 'Take my whitish green plate.' and *Uzmi onaj moj belo-zeleni tanjir.* 'Take my white and green plate.'

3.4.2.1 Clitics

The phonological word is also a unit which regularly includes morpho-syntactic elements such as prepositions, short forms of auxiliary verbs, short forms of personal pronouns, and most conjunctions. What these forms have in common is the lack of stress and hence of pitch accent.^{10,11} Because these elements are prosodically dependent on other elements in a sentence they are categorized as clitics. Prepositions and conjunctions are dependent on

¹⁰In some dialects prepositions get the pitch accent from its complement (the accent 'moves' from the noun onto the preposition). For example, the prepositional phrase *u kuću*, where the accent is on the first syllable of the noun, is in these dialects pronounced as *u kuću* with the accent on the preposition *u*. The preposition with its complement is still a single prosodic unit, since the complement no longer bears the accent. However, in the standard variant of Serbo-Croatian the pitch accent never 'moves' onto the preposition.

¹¹This "rule" is of course violated in contexts of mentioning. That is, if any of these elements are mentioned and not used, then they surface with an accent, a short falling accent. So, it would be possible to elicit these elements with accents in sentences such as *Forma "___" data je kao primer* 'The form "___" was given as an example', which were used in the investigation by Lehiste and Ivić (1986).

the element to their right, and hence are called proclitics. Auxiliaries and short pronominal forms are dependent on the element to their left and are called enclitics. The behavior of enclitics in Serbo-Croatian is more complex than that of proclitics. In addition to their prosodic/phonological requirement, enclitics also gravitate toward the so-called second position, a (presumably) syntactic requirement.¹² Moreover, if more than one enclitic is present in a sentence, they cluster together (and in a particular order).

The clustering property of clitics is sometimes used as evidence for prosodic recursion, because it is only then, when each clitic creates the same prosodic/phonological constituent as the one it attaches to, that the prosodic/phonological requirement of the subsequent clitic can be satisfied. This view is presented in Zec and Inkelas (1990). However, tonally, there doesn't seem to be any evidence for this view. Tonal evidence suggests that enclitics, whether a single enclitic or a enclitic cluster, extend the right edge of a phonological word. That is, when more than one enclitic is attached to a content word, there are no tonal markings that would suggest that there is a phonological word recursion, because the clitics only extend the material over which there is a transition between the second tonal target of the pitch accent on the host and the initial word boundary tone of the following word. As such, they serve as evidence that they are not specified for tone at the surface. This in turn, provides an argument in favor of sparse specification of tones in Serbo-Croatian despite the inherent tonal specification in the lexicon. We look more closely at the tonal properties of clitics in the remainder of this section.

¹²As discussed in Chapter 4, this is a point of contention among researchers. For example, to name just a few researchers in this area, Inkelas and Zec (1990) argue that it is a phonological requirement rather than syntactic; Progovac (1996) provides a syntactic account, whereas Halpern (1995) argues that clitic distribution is governed by both syntactic and prosodic requirements.

Inkelas and Zec (1988) propose an analysis of Serbo-Croatian tonal phonology and they assume that the surface phonological representations are fully specified.¹³ If I understand their proposal correctly, clitics are assigned L tones by the rule of default L insertion, at the post-lexical level. This analysis makes a prediction that when a clitic (or a clitic cluster) attaches to a disyllabic word under the rising accent, the tonal sequence would be a H tone followed by a sequence of L tone(s), i.e. one L target for every clitic that is attached. This tonal specification predicts a steep fall in F_0 from the last syllable of the accented word onto the (first) syllable of the clitic (sequence). This fall from the lexical H tone would occur around the onset of the first clitic and be as steep regardless of the number of following clitics. This prediction is schematically represented in Figure 3.54

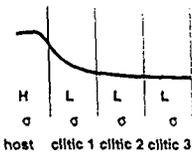


Figure 3.54: A predicted slope for a clitic cluster.

However, when we look at the actual realizations of the F_0 slopes in utterances with one clitic, two clitics, and three clitics, we find that their slopes differ proportionally to

¹³Their underlying phonological representations, however, are underspecified. In their analysis only H tones are present underlyingly.

the number of clitics present. The regression slope values of the three different clitic clusters are presented in Table 3.1, and the regression slope values of the three different clitic clusters are shown in Table 3.1.

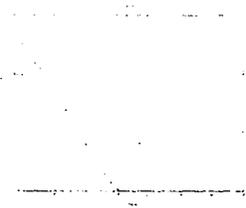


Figure 3.55: A regression slope for a one-clitic cluster.

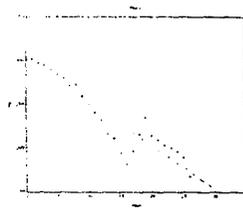


Figure 3.56: A regression slope for a two-clitic cluster.

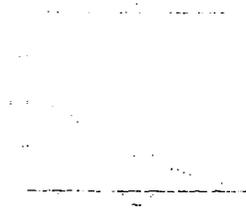


Figure 3.57: A regression slope for a three-clitic cluster.

clitic cluster	one clitic	two clitics	three clitics
slope in Hz/sec	-861.74	-495.24	-318.48

Table 3.1: The slope of the three clitic clusters measured in Hz/sec. It shows that the slope of the utterance with only one clitic is greater than any other, the slope with two clitics is greater than the slope of the utterance with three clitics, but smaller than the utterance with one clitic.

Table 3.1 shows us that the slope of the F_0 towards the %L word boundary tone target differs with respect to how much material there is available. So, with one clitic, i.e. one syllable, the slope is much steeper, whereas with two clitics it is less steep and so on. This difference in slope supports the hypothesis that clitics are not specified for tone and are only interpolating between two tonal targets: that of the last pitch-accent and that of the succeeding word boundary tone. Note that the bigger difference between one-clitic vs. two-clitics than between two-clitics vs. three-clitics is also predicted (if there is no undershoot). This is because $\frac{\Delta F_0}{\Delta t+n}$ will be a logarithmic decline, as shown in Figure 3.58.

In this section I have shown that a phonological word includes enclitics and that there is no prosodic evidence for phonological word recursion. Examination of the F_0 of different size clitic clusters shows that enclitics extend the right edge of the phonological word

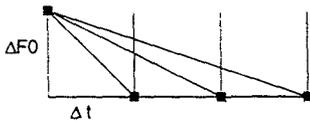


Figure 3.58: A schematic representation of the differences in slopes in one-, two-, and three-clitic slusters.

without any tonal specification of their own. Based on this evidence I argued that Serbo-Croatian intonation system is best accounted for by the assumption that there is sparse specification of tones.

I conclude that the phonological word in Serbo-Croatian is not isomorphic to a morpho-syntactic word: the phonological word can be both smaller and bigger than a morpho-syntactic word. Having examined the defining properties of intonational constituents, we now turn to our goal at the beginning of the chapter defining the difference between a neutral and emotive intonation patterns.

3.5 Neutral vs. Emotive Intonation Pattern

In this section we look at properties of prosodic prominence relevant for focus in more detail. This will allow us to describe the intuitions shared by many scholars of Slavic languages and native speakers that Serbo-Croatian has a tune that can be described as

being prosodically neutral focus as opposed to tunes which have prosodically prominent focus marking.

By prosodically prominent focus marking, I mean prosodically marked emphasis on some smaller constituent in a sentence. Just like English and many other languages, Serbo-Croatian also has means of marking constituents as prosodically prominent. Prosodic prominence can be placed on words, but also on smaller parts of words, such as prefixes: *ne DOlazio, nego ODLazio* 'not coming but leaving' (c.f. Bolinger's example: "This whiskey was not EXported from Ireland, it was DEported.").

Prosodic prominence on a word signals that the word is a part of the semantic focus of a sentence, which is always narrower than the whole sentence. I will call this type of prominence 'focal prominence'. Thus we can say that focal prominence always signals narrow(er) focus.

In neutral intonation patterns, those that lack focal prominence, semantic focus in Serbo-Croatian is signaled via word order, as we have briefly introduced it in Chapter 2 and will look in detail in chapters 5. For word order to signal semantic focus marking, prosodic prominence must be absent. That is, the sentence intonation must have the so-called neutral prominence tune. The neutral prominence tune is the one in which the phrase accent is on the final content word (right-most) in the sentence.

Almost any word (except an enclitic) and some bound morphemes can be prosodically prominent regardless of the position in the sentence and the syntactic function. The phonetic effects of focal prominence are pitch range manipulation of the focal constituent and its immediate environment. A prosodically prominent constituent may be realized in a

slightly expanded pitch range, whereas constituents occurring after it are realized in a significantly reduced pitch range, as we saw earlier in Figure 3.30. In addition, constituents preceding the prosodically prominent word may also be affected by a slight compression of the pitch range. The following five figures show the same sentence with different prosodic prominence patterns. The first figure shows the sentence *Jelena daje Mariji limun* 'Jelena is giving Mary a lemon' as a broad focus utterance and therefore exemplifies a sentence neutral tune. The next four figures show the same sentence with a prosodic prominence on one of the constituents in the sentence, a different one in each case.

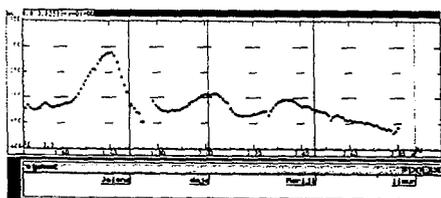


Figure 3.59: *Jelena daje Mariji limun* 'Jelena is giving Mary a lemon.'

As I have argued earlier, prosodic prominence correlates with sentence stress and a phrase accent, a L- phrase accent in this case. Sentence stress can be placed anywhere in the sentence. When it is placed right-most, we get what we perceive as a neutral intonation tune. A neutral intonation tune of the sentence *Jelena daje Mariji limun* "Jelena is giving Mary a lemon" is shown in figure 3.59. Figures 3.60, 3.61 and 3.62, show prosodic

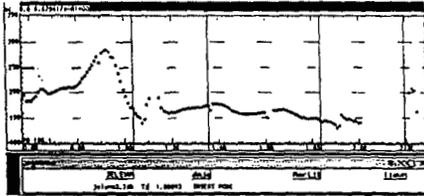


Figure 3.60: *JELENA daje Mariji limun* 'JELENA is giving Mary a lemon.'

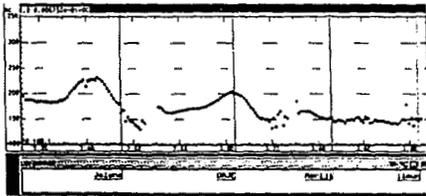


Figure 3.61: *Jelena DAJE Mariji limun* 'Jelena is GIVING Mary a lemon.'

prominence on the subject, the verb, and the indirect object respectively. The pitch tracks in these figures clearly reflect the variable placement of the L- phrase accent in these different conditions of prominence.

It is also possible to put extra prosodic prominence on the final constituent, which receives the phrasal stress in neutral intonation patterns. This is shown in Figure 3.63.

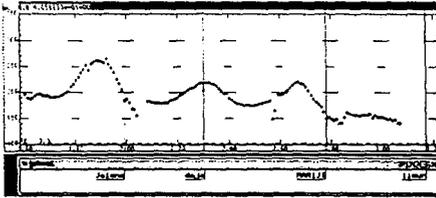


Figure 3.62: *Jelena daje MARIJI limun* 'Jelena is giving MARY a lemon.'

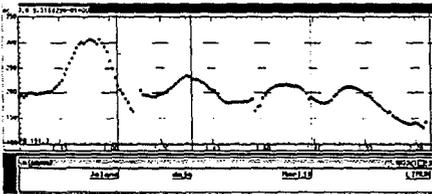


Figure 3.63: *Jelena daje Mariji LIMUN* 'Jelena is giving Mary a LEMON.'

Thus there seem to be three types of prosodic realization of the word in the final position: (i) in a broad focus utterance, figure 3.59, (ii) after prosodic prominence, Figures 3.60, 3.61, and 3.62, and (iii) being prosodically prominent itself, Figure 3.63. Broad focus utterance gives the final constituent a slightly reduced pitch range. Early focal prominence also provides a compressed pitch range for the final constituent. Focal prominence on the final constituent, however, expands the pitch range for this constituent, which is the reverse

of what is observed for this position when it is not prosodically focused. This expansion of the pitch range for the final constituent allows the manifestation of the lexical accent without any reduction and thus shows that pitch accents are not neutralized in the final position.

From the pitch tracks we can see that the neutral intonation pattern in declaratives and the non-neutral intonation patterns clearly differ in their realization of the F_0 . What is the phonological difference between these two patterns since they both contain a L- phrase accent? They differ in the position of the phrase accent. This may seem problematic at first glance because there seems to be a clear difference between the example of focal prominence in the final position and neutral intonation pattern, since the neutral pattern also has prominence on the final word. The two realizations are shown in Figures 3.59 and 3.63. In the neutral pattern the pitch range of the final constituent is narrower than in the focal prominence pattern on this constituent where we see expansion of the pitch range. Yet, we claim that they are phonologically identical. Actually, this is not a problem. What we are dealing with here is the issue of gradience vs. categorical distinctions. This issue is one of the standard problems in phonetic-phonology mapping. Pitch range is obviously a gradient phenomenon, whereas categories that it instantiates are discrete entities. We find the same situation in English as well. In English, the nuclear pitch accent which functions as the focus exponent for a larger phrase is realized in a smaller pitch range than the pitch accent which marks narrow(er) focus of the same constituent. Thus, the generalization that emerges is that narrow focus marking seems to correlate with an expanded pitch range even though our phonological representation in either language does not capture this distinction. Consequently, the absence of reference to this distinction in pitch range in the phonological

representation is a more general problem that needs to be addressed on a more global scale in the phonetics–phonology mapping.

So far, we have only looked at utterances that have prosodic prominence on a single word. In the next section, we look at utterances that involve multiple foci and discuss the type of prosodic prominence used to mark a sentence with more than one focused constituent.

3.5.1 Multiple Foci

An utterance with multiple foci is an answer to a multiple *wh*-question, such as ‘Who ate what?’. These types of utterances in English were first discussed by Jackendoff (1972) and later by Liberman and Pierrehumbert (1984). Jackendoff’s example, ‘FRED ate the BEANS’, was described in terms of his A and B accents. The B accent in this example is associated with the subject, which functions as an independent variable (the value for the *wh*-word that is established first). The A accent is associated with the direct object in this case, functioning as a dependent variable, since its value depends on the value of the independent variable. This utterance construction is also found in Serbo-Croatian, and as we’ll see creates contours that motivate the the H– phrase accent and the %H word boundary tone. Consider the pitch track in figure 3.64.

My analysis of the above contour is that the utterance consists of two intonational phrases: [*Jelena je*]_{IP1} [*Mariji dala*]_{IP2}. The first intonational phrase (IP1) contains a phrase which functions as the independent variable and is marked by the H– phrase accent. This tonal string then is %L L*+H H– (a L word boundary tone, a rising accent and a H– phrase accent). The IP2 starts with %H because the phonological word whose

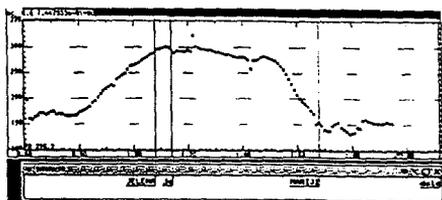


Figure 3.64: *JELENA je MARIJI dala.* 'Jelena gave to Mary.' This utterance was an answer to the question *Ko je kome dao limun?* 'Who gave a lemon to whom?'

edge coincides with the left edge of the intonational phrase functions as the dependent variable and hence is marked by the %H word boundary tone. So, the tonal string in IP2 is: %H L*+H L- L*+H. The L- phrase accent is associated with the right edge of the focus causing the pitch range compression immediately after it. Evidence for this analysis comes from utterances where the two types of focus are not linearly adjacent as they are in Figure 3.64.

When the independent focus is not immediately followed by the dependent focus in the string, there may also be a pause between the two phrases. The possibility of a pause supports the intonational phrase boundary, i.e., the H- phrase accent.

For example, in the utterances in Figures 3.65 and 3.66, the dependent focus was placed at the end of the utterance. There are two pieces of evidence for %H boundary tone marking the constituent that functions as a dependent variable: (i) there is no dip in the pitch contour signalling the L word boundary tones that we find in single focus utterances under neutral intonation pattern and, (ii) signaling the finality of the phrase requires a much steeper fall.

The steeper fall is evidence of a raised pitch range. Positing the %H word boundary tone allows us to explain how we end up with the raised pitch range for the final constituent, because this tonal target requires raising of the floor of the tonal space.

We have seen that in the final position in neutral intonation patterns the final position is realized in a very low pitch range when it is not narrowly focused. In double focus constructions, figures 3.65, 3.66, 3.67, and 3.68, the %H boundary tone is associated with the beginning of the prosodic constituent that contains the dependent focus. The absence of an obvious %L word boundary tones between the words preceding the focus may show that the words preceding the focus are phrased together with the focus into a single prosodic word. However, this conclusion would require carefully controlled experimental data supported by a quantitative analysis. In the absence of such data, I only state this hypothesis as a possibility.

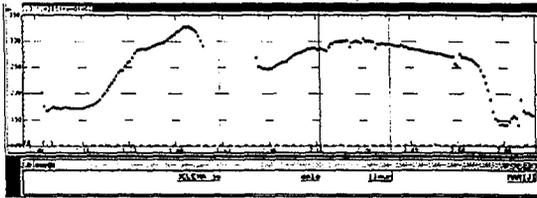


Figure 3.65: An F_0 of *JELENA je dala limun MARIJI.* 'Jelena gave a lemon to Mary' with the dependent narrow focus on the word with the rising accent *Mariji*. This utterance was an answer to the question *Ko je kome dao limun?* 'Who gave a lemon to whom?'

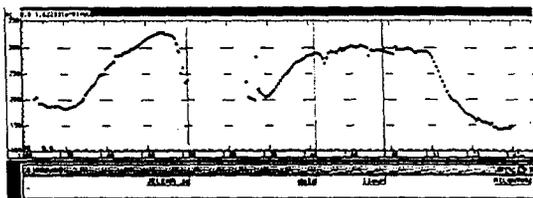


Figure 3.66: An F_0 of *JELENA je dala limun MILOVANU*. 'Jelena gave a lemon to Mary' with the dependent narrow focus on the word with the falling accent, *Milovanu*. This utterance was an answer to the question *Ko je kome dao limun?*, 'Who gave a lemon to whom?'

As Figures 3.64 3.65 and 3.66 show, the %H word boundary tone raises and compresses the pitch range of the prosodic unit it is affiliated with. However, the compressed pitch range does not cause neutralization of the lexical pitch accents. The falling/rising opposition of lexical pitch accents is still realized, as shown by the pitch tracks in Figures 3.67 and 3.68 in comparison with Figures 3.65 and 3.66. These four figures represent F_0 contours of falling/rising opposition in words in final and medial positions in the phrase marked by the %H boundary tone.

The medial position of the phrase marked by the %H tone in figures 3.65 and 3.66 contains the word *limun* 'lemon', which bears a short falling accent on the first syllable. Figures 3.67 and 3.68 contain the word *raVan*, which bears a short rising accent on the first syllable. The two sets of figures show that there is a difference in F_0 in medial positions within the phrase where the words containing the falling vs. rising accents occur. The

words under a falling accent do not show a dip in the F_0 around the first syllable, whereas the words under a rising accent do. This can be explained by the difference between the two lexical pitch accents. The words with the falling accent are inherently specified for the H tone on the first (accented) syllable, whereas the words with the rising accent are specified for the L tone on the accented syllable. Thus the dip in the F_0 in Figures 3.67 and 3.68 is the realization of the starred L tone of the rising accent. The absence of the dip in the F_0 in Figures 3.65 and 3.66 is the realization of the starred H tone of the falling accent.

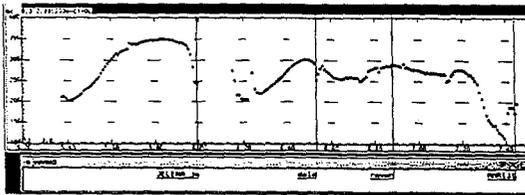


Figure 3.67: *JELENA je dala ravan MARIJI*. 'Jelena gave a/the flat one to Marija.' This utterance was an answer to the question *Ko je kome dao ravan?* 'Who gave a/the flat one to whom?'

To appreciate the influence of the %H word boundary tone on the realization of the lexical accents and phrasing compare the portion of the pitch track corresponding to the phrase containing the %H word boundary tone in Figures 3.65, 3.66, 3.67, and 3.68 to its analogues with neutral focal prominence utterances, shown in Figures 3.69, 3.70, 3.71, and 3.72.

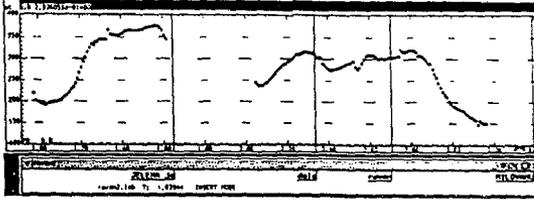


Figure 3.68: *JELENA je dala ravan MILOVANU.* 'Jelena gave a/the flat one to Milovan.' This utterance was an answer to the question *Ko je kome dao ravan?* 'Who gave a/the flat one to whom?'

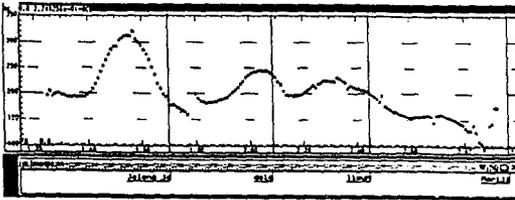


Figure 3.69: *Jelena je dala limun Mariji.* 'Jelena gave a lemon to Marija.'

The analysis proposed here correctly accounts for the difference between these pairs of pitch tracks showing double focus vs. single focus in neutral intonation pattern. The difference consists in phrasing and the tonal marking at the beginning and the end of the prosodic phrases. Double focus constructions are realized in the following way: there are two intonational phrases, one for the independent focus and one for the dependent



Figure 3.70: *Jelena je dala ravan Mariji.* 'Jelena gave a/the flat one to Marija.'

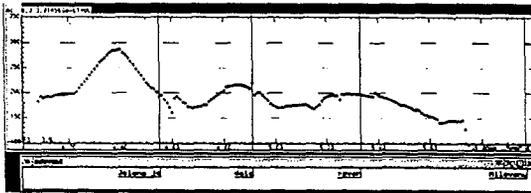


Figure 3.71: *Jelena je dala ravan Milovanu.* 'Jelena gave a/the flat one to Milovan.'

focus. The independent focus is marked by a H- phrase accent whereas the dependent focus is marked by a %H word boundary tone and the L- phrase accent. The %H word boundary tone marks the beginning of the prosodic unit containing the dependent focus. Syntactically, the dependent focus can occur in any position within the prosodic phrase marked by the %H word boundary tone as long as it bears the L- phrase accent. Broad focus utterances, on the other hand, are realized in a single intonational phrase containing

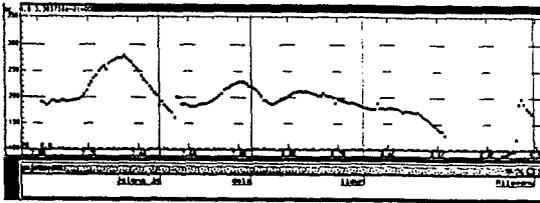


Figure 3.72: *Jelena je dala limun Milovanu.* 'Jelena gave a lemon to Milovan.'

separate phonological words for each content word and a L- phrase accent on the final phonological word in the intonational phrase.

This discussion concludes our exploration of the basic issues in the Serbo-Croatian intonational system. Undoubtedly, this represents an incomplete set of intonational possibilities in the language, but it offers a broad base for further explorations and quantitative studies.

3.6 The Grammar of Serbo-Croatian Intonation

We can summarize the proposal for the intonational system of Serbo-Croatian presented in this chapter in the following way. The intonational lexicon consists of the tonal inventory in table 3.2.

We can represent the intonational morphemes and their mode of combination as a finite state grammar. The finite state grammar of Serbo-Croatian tones is shown in Figure 3.73.

%L	word boundary tone
%H	word boundary tone
L-	simple phrase accent
H-	simple phrase accent
(LH)-	bitonal phrase accent
(HL)-	bitonal phrase accent
(LHL)-	tritonal phrase accent

Table 3.2: Intonational Lexicon

L-	assertion, <i>wh</i> -questions, imperatives
H-	continuation, question
(LH)-	incredulity question
(LHL)-	morphologically marked yes-no question
(HL)-	vocative chant

Table 3.3: Intonational Meanings

This grammar generates all of the mentioned intonational meanings in Table 3.3. However, it also generates certain tunes that we don't seem to find, such as %H T*+T H-. This raises the following question: Where do we want to encode the restrictions on tone combination? I believe that the restriction on tone combination should not be stated in the grammar itself. Rather, if we assume that the meaning of tunes is compositional, as

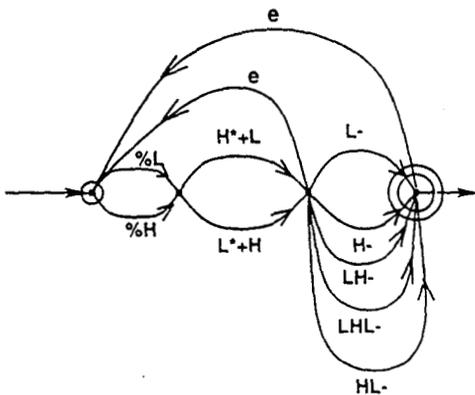


Figure 3.73: A finite state grammar for Serbo-Croatian intonation.

proposed for English by Pierrehumbert and Hirschberg (1990), then the meaning of the tune is the result of the meaning of its constituents. If we view intonational meanings in Serbo-Croatian this way, then the absence of certain tone combinations can be accounted for by the incompatibility of their meanings.

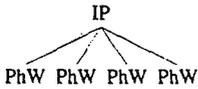
For example, the combination of a %H boundary tone and the vocative chant phrase accent, HL-, is to my knowledge, not found in the language. We may hypothesize that the meaning of %H boundary tone has to do with marking a dependent focus. This intonational meaning is incompatible with a vocative chant because the chant is a calling contour and is semantically unrelated to a dependent focus construction. The combination of the

two would represent a case of semantic anomaly, analogous to the combination of lexical meanings as in Chomsky's famous example "colorless green ideas sleep furiously".

I also want to point out one more non-attested prediction made by this grammar. It also involves the %H word boundary tone. Its distribution in this grammar is stated as identical to the %L word boundary tone: it occurs at the beginning of the phonological word. However, the %H word boundary tone is used to signal the dependent focus of the constituent that bears it. There can be only one dependent focus per intonational phrase, hence only one %H boundary tone in this phrase. In addition, the constituent that is marked by this tone is also marked by the L- phrase accent at its right edge. This means that the sequence ...%H (T*+T)... L- behaves as a unit, and there can be only one such unit per intonational phrase. Ideally, we would like to be able to derive this distributional effect from the pragmatics of the dependent focus and the meaning of tones, but it is not clear exactly how to do this.

To sum up: in the system proposed here, the prosodic structure of Serbo-Croatian is relatively flat. It consists of two types of prosodic constituents: the phonological word, PhW, and the intonational phrase, IP. We can represent it as a tree. A tree representation of an intonational phrase consisting of four phonological words is shown in (100). The phonological word is delimited by a word boundary tone at its left edge and it contains a lexical pitch accent. There are two types of boundary tones: a %L and a %H boundary tone. The intonational phrase contains one of the five phrase accents: L-, H-, LH-, HL-, or LHL-. The intonational phrase is also a domain of pitch range manipulation. There are at least two types of pitch range manipulations: a continuous downtrend and an interrupted downtrend with local upsteps.

(100)



3.7 Conclusion

In this chapter I have presented an overview of Serbo-Croatian intonational system. I have proposed a prosodic analysis of two types of intonation patterns often referred to in the Slavic literature: neutral and emotive (non-neutral). I have shown that from a prosodic point of view these two patterns do not defer, despite their difference from a functional point of view. In both patterns, the correlate of semantic focus is a phrase accent. The only differentiating feature of the neutral pattern is that the phrase accent placement is always right-most. From a cross-linguistic perspective, I have argued that the prosodic correlate of the English nuclear pitch accent is a phrase accent in Serbo-Croatian.

CHAPTER 4

SERBO-CROATIAN SYNTAX

4.1 A Brief Overview of Serbo-Croatian Syntax

4.1.1 Word order

Serbo-Croatian is a head-initial, specifier-initial language. That means that a verb, a preposition, a determiner, or a complementizer precedes its complement; and the subject or a specifier precedes the predicate. The ordering of elements imposed by these two parameters is fairly strict for all types of heads, except for the verb. That is, a D (determiner), a N (noun), a P (preposition), or a C (complementizer) must come first, without exception. Verbal heads, by contrast, allow their complements to precede them. Given that the verb is the lexical head of a clause, the freedom in ordering of verbal complements results in great freedom of constituent ordering at the clausal level.

Despite the fact that any logically possible ordering of verbal complements is found in the language, there is a consensus among researchers that Serbo-Croatian is an SVO language. That is, the canonical or basic ordering in Serbo-Croatian is SVO, and all other orderings are marked (Greenberg, 1966; Bibović, 1971; Nakić, 1978b,a; Popović, 1997;

Mrazović and Vukadinović, 1990; Barić et al., 1990; Progovac, 1994, among many others).¹ One of the main results of this thesis is showing a relationship between the canonical word order and focus projection. We will see that canonical word order in Serbo-Croatian correlates with the full focus projection (i.e., up to the sentence level). The crucial part of the canonical word order, at least in Serbo-Croatian, is the ordering among the nominal arguments.

There seem to be two basic types of approaches to the notion of basic word order: (i) typological and (ii) syntactic. In the language typology literature (Greenberg, 1966; Payne, 1992, among others), basic word order is determined on the basis of statistical frequency (and its consistency with the head parameter). In derivational frameworks within the syntactic literature, basic word order has often been identified with the underlying or D(eep)-structure ordering. For example, on the basis of the syntactic criterion, English can be thought of as a VSO language (McCawley, 1970). This criterion is based on syntactic elegance. The basic word order, or the underlying word order is based on the structure which if taken as the input to syntactic operations provides the most elegant grammar (i.e. the smallest number of operations and constraints needed to derive all surface structures). Thus, the basic word order of a language, determined on the basis of the syntactic elegance criterion, need not necessarily coincide with the surface word order or any derived surface order. Therefore the basic word order determined on the basis of the statistical frequency criterion and the basic word order determined on the basis of the syntactic elegance criterion do not always agree on what the basic word order of a language is. This is because the

¹Dezso (1982) claims that even old Serbo-Croatian was an SVO language, whereas Popović (1997, p.15) cites claims that an older word order might have been SOV.

term basic word order in these two approaches refers to both “underlying word order” and “surface word order”.

A clear example of the syntactization of word order is exemplified in Kayne’s (1994) Antisymmetry framework, where the underlying (base-generated) order is assumed universally to be SVO. In this framework, the typological notion of an SOV or VSO language is derived through the interplay of several theory-internal mechanisms which conspire to trigger leftward movement and produce the surface SOV, VSO, or any other order. Consequently, the surface canonical order in these languages is also a derived order in this theory and hence does not have a privileged status.

In Chapter 5, we will see that focus projection in an all-new focus condition in Serbo-Croatian is only found in canonical orders of verbal complements. Thus, at least as far as focus projection criterion is concerned, the canonical word order is special in some respect. A natural question to ask then is in what sense does canonical word order differ from all the others: for instance, the canonical word order may be base-generated while all others are derived from the canonical order. I will argue that, if we assume a derivational framework, Serbo-Croatian canonical SVO structures are structures where no movement of the verbal arguments out of the VP has applied. All other orderings involve either movement of nominal complements, the verb, or a subpart of the VP.

However, even though in a derivational framework the distinction between the canonical structure and a non-canonical structure can be captured by the presence vs. absence of movement, the correlation between the canonical ordering and movement is coincidental and it is a theory internal fact. The essence of canonical ordering, I believe, is the compatibility with more focus structures than any other ordering of constituents. The intuition of

canonicalness, then, derives in part from and is reinforced by a capacity to serve a wider range of discourse functions.

In derivational frameworks, such as Government and Binding (see Haegeman, 1994), Principles and Parameters (see Culicover, 1997), and their incarnations, different surface word orders are accounted for by optional movement operations (such as scrambling and topicalization). By contrast, in the current Minimalist Framework (Chomsky, 1995), there are no optional movements. All movements must be motivated by some morphosyntactic feature. In this chapter I will assume that optional movements are possible. That is, I will not assume that all movements are triggered by morphosyntax. Rather, I will assume that languages, such as Serbo-Croatian, allow optional movements, as long as the intonational structure is aligned with the syntactic structure according to the requirements of discourse cohesiveness and information structure.

In this chapter I will assume a framework in which base generated structures must be legitimate S-structure objects. That is, no Case-driven movement is necessary and non-canonical structures are derived by leftward movement. The chapter is organized as follows: in the remainder of this section I briefly present the five most salient syntactic properties of Serbo-Croatian: clitics and *pro*-drop, object-shift, negative concord, multiple *wh*-movement and clitic second phenomena; section two deals with the question of configurationality; and section three addresses constituent permutation and the properties of displaced constituents.

4.1.2 Clitics and *pro*-drop

Serbo-Croatian has four types of pronouns: full non-prominent pronouns, full prominent pronouns, clitic pronouns, and the so-called zero pronoun or *pro*. Clitics and *pro* are in complementary distribution. Clitics can occur in non-subject positions, whereas *pro* occurs only in the subject position.² Thus, *pro* is in some sense a subject clitic. The distribution of *pro* and clitics is governed by discourse constraints which are a subset of constraints regulating pronominalization in general.

In the syntactic literature Serbo-Croatian is called a subject *pro*-drop language. That is, the overt indexical (first and second person) pronominal subjects are regularly omitted, as in (101). Under proper discourse contexts, in which a particular entity is the most salient (i.e. it is the backward looking center in terms of Centering Theory (Grosz and Sidner, 1986)), the full third person pronouns must also be replaced by clitics, as shown in (102).

(101) a. What are you doing?

b. Čitam knjigu.
reading.1P book.ACC
'I am reading a book.'

c. #Ja čitam knjigu.
I reading.1P book.ACC
'I am reading a book.'

²I am disregarding implicit arguments in non-subject positions, which may or may not be interpreted as a syntactic argument *pro*.

(102) a. Where is Milan?

b. Juče sam ga videla u školi.
yesterday AUX.1P him.CL saw in school
'I saw him at school yesterday.'

c. #Juče sam njega videla u školi.
yesterday AUX.1P him saw in school
'I saw him at school yesterday.'

(101) and (102) show that the use of an overt full pronoun is unacceptable in contexts in which the referent of the pronoun is highly salient (i.e. such as, when it is part of the question under discussion). When the referent referred to is in the subject position, the pronoun must be dropped, (101); and when the referent referred to is in the object position, the pronoun must be in its clitic form, (102).

4.1.3 Object-shift

Stojanović (1997) argues that Serbo-Croatian pronominal objects, such as quantificational pronouns and full personal pronouns, cannot occur in the canonical object position (after the verb) as do other types of objects. That is, Stojanović argues that Serbo-Croatian has an obligatory object shift, analogous to pronominal object raising argued for Scandinavian languages (Holmberg, 1986). She argues that the (b) sentences in (103) and (104) are more easily accepted by the native speakers than the (a) sentences.

(103) a. ?Jelena me stalno zapitkuje nešto.
Jelena.NOM me.CL constantly asks something.ACC
'Jelena is constantly asking me something.'

b. Jelena me stalno nešto zapitkuje.
Jelena.NOM me.CL constantly something.ACC asks
'Jelena is constantly asking me something.'

(104) a. ?Marija stalno sreće njega.
Marija.NOM constantly meets him
'Marija sees him constantly.'

b. Marija njega stalno sreće.
Marija.NOM him constantly meets
'Marija sees him constantly.'

We will see in Chapter 5 that in neutral intonation the (a) type sentences are interpreted as having narrow focus on the pronominal object. This fact will be explained in terms of focus projection in Chapter 5. Thus, unless the discourse requires narrow focus on the pronominal, the (a) sentences are inappropriate. Given that narrow focus structures require more specific contexts, the unacceptability judgments that native speakers provided for the (a) sentences that Stojanović discusses seems perfectly natural.

4.1.4 Negative Concord

One of the salient properties of Serbo-Croatian syntax is negative concord. Roughly, that means that if an NP (all arguments and some adjuncts) is marked with a negative prefix (a

negative quantifier), the verb must be negated as well. In other words, despite the presence of multiple negations in the clause, the clausal semantics is identical to that of a single negation. There are two types of negative-concord languages: full concord and partial concord languages (see Haegeman, 1995; Zanuttini, 1997; Brown, 1999). In full concord languages (Russian, Serbo-Croatian) all negated arguments trigger negation on the verb, whereas in partial concord languages (Spanish, Italian) only VP internal arguments do. However, the negation on the verb does not trigger any agreement on its arguments or adjuncts. The following examples, (105a), (106a), and (107a), where the negative quantifier is not matched with the negation on the (tensed part of the) verb are ungrammatical.

(105) a. *Niko je došao.

no one.NOM aux came

'No one came.'

b. Niko nije došao.

no one.NOM neg.aux came

'No one came.'

(106) a. *Petar je dao nikome sladoled.

Petar.NOM AUX gave no one ice cream.ACC

'Petar gave no one ice cream.'

b. Petar nije dao nikome sladoled.

Petar.NOM NOT.AUX gave no one ice cream.ACC

'Petar gave no one ice cream.'

(107) a. *Petar je nikad živeo u Beogradu.

Petar.NOM AUX never lived in Belgrade

'Petar never lived in Belgrade.'

b. Petar nije nikad živeo u Beogradu.

Petar.NOM NOT.AUX never lived in Belgrade

'Petar never lived in Belgrade.'

These examples show that in Serbo-Croatian both internal and external argument of the verb and verbal adjuncts trigger negative concord. Thus, Serbo-Croatian is a full negative concord language.

4.1.5 *Wh*-movement

Serbo-Croatian has obligatory *wh*-movement for all *wh*-words. Consequently, Serbo-Croatian is a multiple *wh*-movement language.³ This is illustrated by the following examples.

(108) a. *Ko je juče udario koga?

who.NOM aux yesterday hit who.ACC

'Who hit who yesterday?'

b. Ko je koga juče udario?

who.NOM aux who.ACC yesterday hit

'Who hit who yesterday?'

³An extensive comparative analysis of multiple *wh*-movement for the Slavic languages is given in Rudin (1988).

c. *Ne znam ko je juče udario koga.
 not know.1P.SG who.NOM aux yesterday hit who.ACC
 'I don't know who hit who yesterday.'

d. Ne znam ko je koga juče udario.
 not know.1P.SG who.NOM aux who.ACC yesterday hit
 'I don't know who hit who yesterday.'

When a *wh*-word is left in situ, as in (108a) and (108c), the sentence is ungrammatical. However, when all the *wh*-words are fronted to a clause initial position, as in (108b) and (108d), the sentence is grammatical.

Despite the fact that all *wh*-words must be fronted at S(urface)-structure, there is evidence that they are not all in the same position. Rudin (1988) has pointed out that clitics must and adverbs can intervene between the first *wh*-word and the second *wh*-word, as in (109), showing that only the first *wh*-word is in the [spec CP] position at the surface structure.

(109) Koga je nedavno ko iskritikovao?
 who.ACC AUX recently who.NOM criticized
 'Who criticized who recently?'

Unlike in English, in Serbo-Croatian *wh*-words can bind a pronoun in the subject position. That is, *wh*-movement ameliorates Weak Crossover effects, as shown in (110). However, in multiple *wh*-questions, only the first *wh*-word can bind the pronoun in the subject position. This is shown in (111). This is an additional piece of evidence that in multiple *wh*-questions the *wh*-words are not all in the same position. Only the first *wh*-word seems to have scope over the subject.

(110) Koga_i njegov_i sestra mrzi?
who.ACC his.NOM sister.NOM hates?
'Who does his sister hate?'

(111) a. Koga_i je kome_j njegov_{i/oj} sestra predstavila?
who.ACC AUX who.DAT his.NOM sister.NOM introduced
'Who did his sister introduce to whom?'

b. Kome_i je koga_j njegov_{i/oj} sestra predstavila?
who.DAT AUX who.ACC his.NOM sister.NOM introduced
'Who did his sister introduce to whom?'

4.1.6 Clitic-Second

Serbo-Croatian has a number of syntactic clitics: short forms of personal pronouns, and the short form of the reflexive pronoun *sebe* 'self', auxiliary verbs, which are short forms of the present tense and the aorist of the verb *biti* 'to be' and *hteti* 'want'; and the question particle *li*. The reason these forms are considered syntactic clitics is because they must occur in the so-called second position in their clause. This is in contrast to other (prosodic) clitics, such as prepositions, conjunctions, and the sentential negation morpheme, which procliticize onto their complements, with no restriction on their clausal position.

The syntactic clitics cluster together in a particular order: *li* first; followed by auxiliaries other than *je* 3p.sg. present of *biti* 'to be'; followed by pronouns in the order: dative, genitive/accusative, reflexive, and finally *je*. This ordering is strict and cannot be violated.

Often, the second position can be identified as “after the first word in a clause”. This is shown in example (112a), where *li* follows the only word in the matrix sentence and the other three clitics (which belong to the subordinate clause) immediately follow the complementizer *da*. Any other ordering of the clitics produces an ungrammatical sentence.

- (112) a. Misliš =li da =ćemo =ga =se
 think2P.SG Q.particle that will1.PL.CL him.GEN.CL REFLX.CL
 otarasiti do sutra?
 get.rid.off by tomorrow.
 ‘Do you think that we’ll be able to get rid of him by tomorrow?’

- b. *Li misliš da otarasiti
 Q.particle think.2P.SG that get.rid.off
 ćemo ga se do sutra?
 will1.PL.CL him.GEN.CL REFLX.CL by tomorrow

However, the second position does not always follow the first word. For instance, the clitic cluster cannot occur after the first word when the first word is the head noun of a relative clause. The clitic cluster, in that case, must follow the entire NP. Despite this evidence that clitics are sensitive to constituents, in chapter 5 I will have to appeal to the prosodic or “the first word” analysis of clitic placement.

(113) a. Devojka koja je radila juče poslepodne
 girl.NOM who.NOM AUX.CL worked yesterday afternoon
 mu ga je prodala
 him.DAT it.ACC AUX.CL sold
 'A/The girl who worked yesterday afternoon sold it to him.'

b. *Devojka mu ga je koja je radila
 girl.NOM him.DAT it.ACC AUX.CL who.NOM AUX.CL worked
 juče poslepodne prodala
 yesterday afternoon sold

The ungrammatical sentence, (113b), shows that clitics also obey the so-called "first constituent" constraint. That is, clitics can occur only after the first syntactic constituent. In this case, an NP containing a relative clause.

Clitic cluster placement is one of the most recalcitrant problems in the Serbo-Croatian syntax and syntax-phonology interface. Despite being a widely researched topic by generative linguists of all persuasions (see *inter alia* Browne, 1974; Zec and Inkelas, 1990; Schütze, 1994; Halpern, 1995; Progovac, 1996; Penn, 1999), it has resisted a unified analysis.

4.2 Sentence Structure: Flat or Configurational?

The notion of configurationality plays a role at a number of different levels: CP, IP, VP, NP, PP. That syntactic constituents have hierarchical organization is beyond a doubt. However, the question is: Which constituent types have a hierarchical structure? (see Horvath, 1986;

Marác and Muysken, 1989). I will not pursue this question regarding hierarchical organization for the CP, NP or PP, because their internal structures have little bearing on the issue of focus projection.⁴ For our purposes the two relevant constituents are IP and VP, that is, the levels associated with the clause.

Free constituent ordering among verbal arguments has often been used as evidence in favor of a non-configurational (flat) structure at the level of the clause. In the early 80's, languages that allow syntactically free ordering of verbal arguments within a clause, such as Hungarian, Japanese, Korean, have been treated as non-configurational (Hale, 1982; Farmer, 1984). However, for all of these "scrambling" languages, a configurational analysis has been subsequently supported with arguments from both syntax and pragmatics involving notions such as topic and focus. Since Serbo-Croatian is also a scrambling language with pragmatically constrained constituent order, in this chapter we will look at the type of syntactic evidence for configurational structure at the level of a clause.

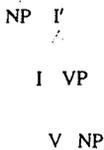
Thus, to begin with, we will look at the evidence for hierarchical organization within the IP. That is, we will try to motivate a syntactic reflex corresponding to the semantic distinction between a subject and a predicate. After we have motivated the existence of a syntactic unit denoting a predicate, we will briefly address the next question which pertains to whether there is any evidence for hierarchical organization within VP. The standard tests show that Serbo-Croatian is configurational. However, I will also point out that some of the tests can be shown to not be very strong.

⁴For evidence of the hierarchical organization within the Serbo-Croatian NP see Leko (1986, 1999); Zlatić (1997).

4.2.1 Evidence for VP

Evidence for hierarchical organization within a clause can be categorized into two types: (i) evidence for a syntactic constituent such as a VP, and (ii) evidence showing subject/object asymmetries. Both of these properties are syntactically encoded in a structure which separates the subject from a predicate. Thus, the structure that we want to argue for in this section is exemplified in (114), and the one that we want argue against is shown in (115).

(114) IP



(115) IP



4.2.1.1 VP Constituency Tests

We will proceed by considering several standard tests for constituency: (i) sentence fragments, (ii) movement, (iii) coordination, and (iv) ellipsis.

Consider first the sentence fragment test. According to this test, if a string is a constituent it can occur as an answer (a sentence fragment) to a question. As we can see in (116), a (main) verb and its complement can function as a sentence fragment.

(116) a. Šta je Marija uradila danas?

what did Mary.NOM do today

'What did Mary do today.'

b. Napisala pismo.

wrote.3SG.PERF letter.ACC

'(She) Wrote a letter'.

c. Pismo napisala.

letter.ACC wrote.3SG.PERF

'(She) Wrote a letter'.

The following examples (from Radford, 1988) show that the movement test yields the same results as the sentence fragment test. That is, there is a constituent that we could call a VP in Serbo-Croatian, because it is possible to front a string corresponding to a VP, as identified by the sentence fragment test.

(117) Ako bi vozač rekao pijanima da moraju da sidju

if would driver tell drunks that must that get.off

s autobusa, sišli s autobusa oni (ne) bi.

from bus get.off from bus they (not) would

'If the driver told the drunks that they must get off the bus,

then get off the bus they would (not).'

(118) a. Šta bi pijani uradili?

what would drunks do

'What would the drunks do?'

b. Sišli s autobusa
get.off from bus
'Get off the bus.'

We get the same result with other examples as well. Consider (119) and (120)

(119) Šef restorana misli da bi pijani razjurili mušterije
manager restaurant thinks that would drunks chase.off customers
i razjurili mušterije oni sigurno bi.
and chase.off customers they certainly would
'The restaurant manager thinks that the drunks would put off the customers,
and put off the customers they would.'

(120) a. Šta bi pijani uradili?
what would drunks do
'What would the drunks do?'

b. Razjurili mušterije, eto šta.
chase.off customers that what
'Chase off the customers, that's what they would do.'

Coordination tests are often used to show that a string is a constituent. The reasoning behind this test is based on the idea that two constituents can be coordinated if they are alike. Although we do find examples of coordination of non-like constituents such as NP and PP or AP ("He is a president and proud of it."; "She is gay and in the closet."), these are counterexamples to the second condition only. That is, the counterexamples show that

two coordinated constituents need not be of the same category. They do not invalidate the reasoning that for a string to function as a conjunct it must be a constituent. It is simple to show that strings that denote a predicate can be coordinated, as (121) shows.

(121) a. Marija je pojela svu pršutu i popila svo vino.

Marija.NOM AUX ate all prosciutto and drank all wine

'Marija ate all of the prosciutto and drank all of the wine.'

b. Oni su prodali kuću i kupili stan.

they AUX sold house and bought apartment

'They sold the house and bought an apartment.'

c. Niko nije niti pročitao knjigu niti gledao film.

no one.NOM not.AUX neither read book.ACC nor watch movie.ACC

'No one read the book nor saw the movie.'

However, there are a number of robust constructions involving non-constituent coordination in English, which do invalidate the second condition of the coordination test, i.e., the condition that says that a conjunct must be a syntactic constituent. For example, it is possible to coordinate two internal arguments of the verb, as in *I gave [John a magazine] and [Mary a book]*. Intuitively, it seems clear that neither [John a magazine] nor [Mary a book] is a syntactic constituent, and yet, they can be coordinated. A fairly common syntactic analysis of this construction, as well as those known as "gapping", assumes that these types of examples involve coordination of constituents, VP and IP, respectively, where the main verb is missing in the second conjunct. The missing verb from the second conjunct

is analyzed as deleted under the condition of semantic identity with the verb from the first conjunct.

A number of authors have shown that (Dowty, 1996, e.g.) this type of coordination is possible with a number of different constituent types: two NPs, an NP and a PP, an Adv and a PP, etc. Moreover, the elements within a conjunct can be arguments, or an argument and an adjunct, which shows convincingly that they are not a syntactic constituent. Consequently, these types of examples are damaging for the validity of the coordination test as a test of syntactic constituency as being independent of the stipulation that only constituents can be coordinated. However, I have included it here as a part of the standard set of assumptions often used for the purpose of testing for VP.

Ellipsis (deletion) has also been used as a test for syntactic constituency. There are two kinds of ellipsis that need to be distinguished before this test can be applied to the VP constituency question. These two types are illustrated in (122), using English examples.

(122) a. Mary drank the beer, and John did too.

b. Mary drank the beer, and John as well.

The sentence in (122a) is an example of VP ellipsis. The sentence in (122b) is an example of stripping, or bare argument ellipsis. The two constructions differ in the presence vs. absence of the auxiliary: the VP ellipsis construction has the auxiliary whereas the stripping construction does not. Semantic analyses of stripping in English assume that the missing constituent is a clause with a gap, rather than a VP (Reinhart, 1991; Rooth, 1992; Heim and Kratzer, 1998). On the Heim and Kratzer analysis, the subject in the second conjunct is assumed to have been topicalized prior to deletion of the IP node.

If the presence of the auxiliary is the test for VP ellipsis then, Serbo-Croatian allows VP ellipsis only in periphrastic tenses.⁵ This is because Serbo-Croatian neither has a VP pro-form nor can it use an auxiliary as a pro-form for a VP, as English can. We can see this difference most clearly by comparing the different ways by which Serbo-Croatian and English affirm a VP.

(123) a. A: Do you love her?

b. B: I do.

(124) a. A: Da li je voliš?

A: yes Q.part. AUX love.2P.SG.PRES.

'Do you love her?

b. B: Volim.

B: love.1P.SG.PRES.

'I do.' (literally 'I love.')

c. B: *Sam.

B: BE.AUX.1P.SG.PRES.CL

(125) a. A: Eat your dinner.

b. B: I did.

⁵Periphrastic constructions are constructions that are formed by combining content words with function words or auxiliaries instead of by inflecting the content word itself. In Serbo-Croatian (periphrastic) past tense, the auxiliary signals the person and the main verb signals the tense and the gender. In the future tense, the auxiliary signals the person and the tense, and the main verb is expressed either by the infinitive form or through a subordinate clause containing the main verb inflected for person and the present tense.

(126) a. A: Pojedi večeru.

A: eat dinner

'Eat the dinner.'

b. B: *Sam

B: BE.AUX.1P.SG.PRES.CL

c. B: *Jesam

B: BE.AUX.1P.SG.PRES.

d. B: Pojeo sam

B: eat.PAST.PART.MASC BE.AUX.1P.SG.PRES.CL

'I did.' (literally 'I ate.')

This difference in the use of auxiliaries in Serbo-Croatian has the effect of precluding the possibility of VP ellipsis in anything but the three periphrastic tenses: the past tense, the future tense, and the past perfect.

(127) a. Jelena je zaspala u vozu, a i Marija je (isto tako).

Jelena.NOM AUX fell.asleep in train, and Marija.NOM AUX same thus

'Jelena fell asleep on the train, and Mary did too.'

b. Jelena je zaspala u vozu, a i Marija isto tako.

Jelena.NOM AUX fell.asleep in train, and Marija.NOM same thus

'Jelena fell asleep on the train, and Mary as well.'

The two examples in (127) illustrate the difference between VP ellipsis, (127a), and stripping, (127b). Both are acceptable since the past tense provides the auxiliary, but crucially, only (127a) is evidence for a VP. If we look at examples that involve the present tense, we only have evidence for stripping, rather than VP ellipsis. Consider (128).

(128) a. Marija voli Milana, a i Jelena takodje.

Marija.NOM loves Milan.ACC and also Jelena.NOM too.

'Marija loves Milan, and Jelena too.'

b. *Marija voli Milana, a i Jelena je takodje.

Marija.NOM loves Milan.ACC and also Jelena.NOM AUX too.

'Marija loves Milan, and Jelena does too.'

The grammatical sentence in (128a) does not have an auxiliary. Adding the auxiliary makes the example ungrammatical, (128b).

Besides the presence of an auxiliary, there are other conditions on VP ellipsis in Serbo-Croatian. One of the necessary conditions for VP ellipsis is the presence of a governing head at the site of the deletion (Fiengo and May, 1994). In English, the governing head can be an auxiliary, a modal, or a sentential negation (see Potsdam, 1997). These types of heads are also possible governors in Serbo-Croatian as well. Another property is that, unlike gapping, which can only occur in coordinations (see McCawley, 1988), VP ellipsis can occur both in coordinations and subordinations. A property distinguishing subordinating conjunctions from most coordinating conjunctions in Serbo-Croatian is that they are all prosodically full words (bear an accent) and hence obligatorily attract syntactic clitics (i.e., auxiliaries). This combination creates a condition in which the governing head for a VP

ellipsis, an auxiliary, is not present at S-structure at the deletion site. The result is that VP ellipsis is ungrammatical in that situation. Consider the following examples.

- (129) a. *Milan će da popije što god je i Petar.
Milan.NOM will.AUX that drink.3P.SG whatever AUX also Petar.NOM
'Milan will drink whatever Petar has.'
- b. *Niko neće podržavati Miloševića,
no one.NOM won't support Milošević.ACC
iako su ga Rusi.
although AUX him.ACC.CL Russians.NOM
'No one will support Milošević, although Russians have.'

Our hypothesis is that the deleted VP occurs after the subject, given the assumption that the structure of the clause reflects the subject/predicate split. However, since the auxiliaries are syntactic clitics, they must occur in the second position. In the case of (129a), the second position is the position immediately after the relative pronoun. In the case of (129b), the second position is the position immediately after the subordinating conjunction 'although'. Obeying the second position constraint for clitics places the clitics before the subject. The deleted VP then is no longer governed by an overt head. Hence, VP ellipsis is impossible. If this explanation of the ungrammaticality of examples in (129) is correct, then we also have evidence that clitic placement is syntactic and not just prosodic, contra Radanović-Kocić (1988), since it plays a crucial role in a syntactic phenomenon such as VP deletion. If clitic placement was a PF phenomenon as sometimes argued (Radanović-Kocić,

1988; Zec and Inkelas, 1990; Halpern, 1995), then VP deletion should not be sensitive to the S-structure placement of clitics.

In summary, despite the ungrammaticality of some examples of VP ellipsis, I have shown that VP ellipsis is possible when the already argued for conditions for VP ellipsis are satisfied. Thus, evidence for a syntactic VP constituent comes from VP-ellipsis tests in examples involving periphrastic tenses and coordination.

In the above examples, VP ellipsis has been used as evidence for a syntactic VP constituent. However, it is arguable whether this test tests for surface syntactic constituency. Consider the following examples where the discontinuous VP material is underlined:

- (130) a. Marija je pozdravila Petra jer je i Milan
Marija.NOM AUX greeted Petar.ACC because AUX also Milan.NOM
'Mary greeted Peter because Milan did too.'
- b. Petra je Marija pozdravila jer je i Milan
Petar.ACC AUX Marija.NOM greeted because AUX also Milan.NOM
'Mary greeted Peter because Milan did too.'
- c. Pozdravila je Marija Petra jer je i Milan
greeted AUX Marija.NOM Petar.ACC because AUX also Milan.NOM
'Mary greeted Peter because Milan did too.'

If the condition on VP ellipsis was a syntactic identity, we would expect only (130a) to allow VP ellipsis. This is because the first conjunct in (130a) is a sentence with a canonical order and hence there is a contiguous string in the surface that constitutes a VP that can serve as the antecedent of the deleted VP in the second conjunct. However, even

in scrambled variants of (130a) where there is no contiguous string that constitutes a VP at the surface, VP ellipsis is possible. The interpretation of (130c) is the one found in (131), where the missing VP is crossed out. But, as we can see, there is no antecedent for the underlined constituent in the first conjunct.

- (131) Pozdravila je Marija Petra
 greeted AUX Marija.NOM Peter.ACC
 jer je i Milan ~~pozdravio~~ Petra
 because AUX also Milan.NOM greeted Peter.ACC
 'Mary greeted Peter because Milan did too.'

Examples in (130) then show that conditions on VP ellipsis do not involve a surface syntactic constituent but rather a semantic constituent denoting a predicate. This constituent can be obtained either at LF, assuming a reconstruction of the VP (Williams, 1977; Fiengo and May, 1994) at this level (i.e. undoing the scrambling), or at the post-LF semantic level (Dalrymple et al., 1991). As a result of acceptability of VP ellipsis even in scrambling structures, our original application of the ellipsis test is not a strong evidence for a syntactic VP in Serbo-Croatian.

4.2.1.2 Subject/Object Asymmetries

Another type of argument for a VP involves demonstrating that subjects are different from objects. The rationale is that if subjects and objects differ with respect to critical syntactic properties, then this distinction will have a syntactic reflex. A hierarchical structure in which subjects are hierarchically superior to objects is a possible way of representing the differences between them.

Serbo-Croatian subjects differ from objects in a number of respects: (i) overt case marking (modulo case syncretism in the inanimate declination classes), (ii) *pro*-drop, (iii) reflexivization, (iv) verbal agreement, (v) adjunct control, (vi) adverb orientation. These descriptions are a shorthand for the following properties. (i) Overt case marking differentiates subjects from objects: subjects carry the nominative case morphology, whereas objects carry the accusative or genitive case morphology. (ii) Only subjects can be elided in *pro*-drop. That is, only subjects can be missing in overt structure in the discourse conditions conducive to reduction from full referring expressions. (iii) Reflexives can be objects but they cannot be subjects, and only subjects can be antecedents to reflexives. (iv) Verbal elements show agreement morphology with their subjects and never with their objects. (v) Missing subjects in adjunct non-finite clauses must be controlled by the main clause subjects rather than by objects. (vi) There is a class of adverbs that specifically modifies subjects, whereas there is no class of adverbs that modifies objects. The following examples illustrate these properties.

The example in (132a) illustrates morphological case differentiation, and subject verb agreement. Since the subject is the third person feminine, the auxiliary is marked for the third person, whereas the past participle carries the feminine gender agreement. The participle marked for the masculine agreement produces ungrammaticality. Examples (132b) and (132c) show that the subject can be omitted, whereas the object cannot.

(132) a. Marija je prodala / *prodao stan.

Marija.NOM AUX.3P.SG sold.FEM sold.MASC apartment.MASC.ACC

'Marija sold an apartment.'

(141) Mary hurt John, didn't she / *didn't him?

Serbo-Croatian also has tag questions: however, the tag can include clitics referring back to different participants via case agreement. That is, a dative clitic in a tag refers back to the dative argument in the main clause, as in (142c). This property of Serbo-Croatian tag questions clearly shows that subjects are not special in this regard.

(142) a. Marija je uvredila Milana zar ne?

Marija.NOM AUX offended Milan.ACC Q.PART not

'Marija offended Milan, isn't it the case?'

b. Marija je uvredila Milana zar ga nije?

Marija.NOM AUX offended Milan.ACC Q.PART him.ACC.CL not.AUX

'Marija offended Milan, didn't she him?'

c. Marija je Milanu pokazala auto

Marija.NOM AUX Milan.DAT showed car.ACC

zar mu ga nije?

Q.PART him.DAT.CL him.ACC.CL not.AUX

'Marija offended Milan, didn't she it to him?'

Summary: Only some of the subject/object asymmetry tests argue for the subject/predicate split. Many of the differentiating properties can be attributed to the semantic properties of subjects or delegated to the morphology. To the extent that these properties have structural correlates, they support the structural differentiation between subject and objects.

4.2.2 Flat or Hierarchical VP?

On the assumption that we have provided sufficient, although by no means incontrovertible, evidence to support the reflection of the subject/predicate split in the syntax in terms of a syntactic VP constituent, we are now in a position to consider the question of whether there is further structure within the VP itself. Two possibilities present themselves: either the structure of the VP is flat and consequently all of its arguments are sisters, or it is configurational and some arguments are attached higher than the others. Anaphor binding is often used as a test for height, on the assumption that binding requires c-command.⁸ Of the two types of anaphors, reflexives and reciprocals, only reciprocals can be used to test the structure within VP. This is because reflexives, as shown in the previous section, are always subject oriented and hence no non-subject can function as an antecedent to a reflexive.

In order to look at examples involving binding within a VP, my starting assumption is that the canonical ordering of arguments within a VP is < indirect object, direct object >.⁹ With this in mind, we can consider examples (143) and (144). These examples seem to show that the dative argument is higher than the accusative argument within the VP, since the dative can bind the reciprocal, whereas the accusative cannot.

⁸I assume the following definition of c-command: "X c-commands Y iff neither X nor Y dominate each other and the lowest Z dominating X also dominates Y."

⁹This argument ordering is also true of German, and of other Slavic languages.

(143) Milan je predstavio studentima, jedan drugoga.
Milan.NOM AUX introduced students.DAT each other.ACC
'Milan introduced each other to the students.'

(144) *Milan je predstavio jedne drugima, studente.
Milan.NOM AUX introduced each other.DAT students.ACC
'Milan introduced the students to each other.'

However, the conclusion reached on the basis of (143) and (144) may seem hasty when the examples in (145) and (146) are considered.

(145) Milan je predstavio studente, jedne drugima.
Milan.NOM AUX introduced students.ACC each other.DAT
'Milan introduced the students to each other.'

(146) *Milan je predstavio jedan drugoga, studentima.
Milan.NOM AUX introduced each other.ACC students.DAT
'Milan introduced the students to each other.'

Given that argument ordering is free, the two arguments, the dative and the accusative, can switch places within the VP, and in that case the dative no longer is able to bind the accusative, shown in (146); and moreover the accusative can bind the dative, shown in (145).

These binding facts within a VP suggest at least two possibilities: either (i) the VP internal arguments can be base generated in any order and hence there is no canonical ordering of arguments and the argument generated higher in the structure can function as a

binder; or (ii) the structure of VP is flat and binding conditions do not involve c-command (the notion involving domination relation) at all but rather only linear precedence. According to Culicover (1997, p.167) and Radford (1997, p.368), the choice between these two hypotheses is driven by a methodological or theory internal premise. One would choose option (i) in order to maintain a consistently local view of phrase formation by which phrases are formed through the operation "merge", which can only take two nodes at a time. In most of generative syntax, this methodological premise (which imparts complete primacy to configuration) precludes the alternative (ii).

In addition to binding, there are other tests that have been used as a probe for structure within the verb phrase. One of the tests used in English is the *do so* test. This test provides evidence for some hierarchical organization of constituents within the verb phrase in English.¹⁰ In particular, adjuncts can be separated from the core VP that is the antecedent of the "do so", as shown in (147). Contrast (148), where the indirect object cannot be separated in the ditransitive VP.

(147) Mary bought a new pair of shoes in New York and Susan did so in Chicago.

(148) *Mary gave a book to Susan and Bill did so to Lidia.

The Serbo-Croatian VP pro-form analogous to English *do so* is *to uraditi* 'do that'.

Example (149) illustrates this point.

¹⁰For a detailed discussion of this and the VP-topicalization test for English (see Culicover, 1997, pg.163-4)

(149) Marija je napisala domaći u autobusu
 Marija.NOM AUX wrote homework.ACC in bus
 a Jelena je to uradila kod kuće.
 but Jelena.NOM AUX that did at home
 'Marija wrote her homework on the bus but Jelena did so at home.'

(150) a. *Petar je poklonio Milanu knjigu
 Petar.NOM AUX gave Milan.DAT book.ACC
 a Marija je to uradila sat.
 and Marija.NOM AUX that did watch.ACC
 'Petar gave Milan a book and Marija did so watch.'

b. *Petar je poklonio knjigu Milanu
 Petar.NOM AUX gave book.ACC Milan.DAT
 a Marija je to uradila Jovanu.
 and Marija.NOM AUX that did Jovan.DAT
 'Petar gave Milan a book and Marija did so to Jovan.'

However, as (148) and (150) the *do so* test does not provide any evidence for differentiating elements within the core verb phrase in either language. This result can be interpreted in two ways, either the structure is flat, or the test is not sensitive enough to illuminate the structure within the core VP. We will look at one more test, the test of adverb placement, before we move on to the issue of word order within a VP and a clause.

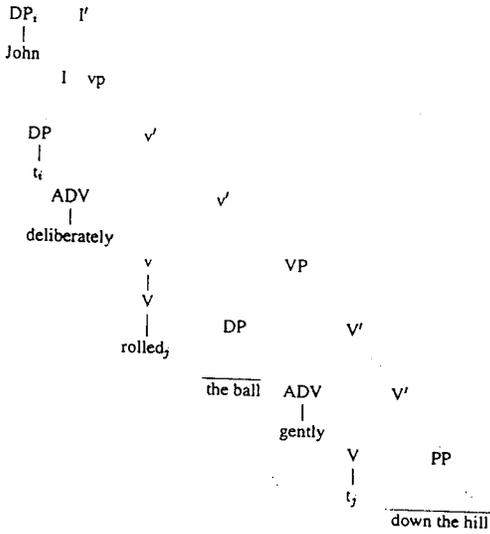
Another probe into structure of verb phrases has been the placement of adverbs (see Bowers, 1993; Iatridou, 1990; Radford, 1997; Vikner, 1995; Potsdam, 1997, among others). There are two major hypotheses about integration of adverbs into the syntactic structure. On one hypothesis, adverbs are adjuncts (Pollock, 1989; Johnson, 1991; Bowers, 1993, among others). On another hypothesis, adverbs are licensed by a head and occupy a specifier position (Kayne, 1994; Alexiadou, 1997; Cinque, 1997; Laenzlinger, 1998). I will adopt the assumption that adverbs are adjuncts.

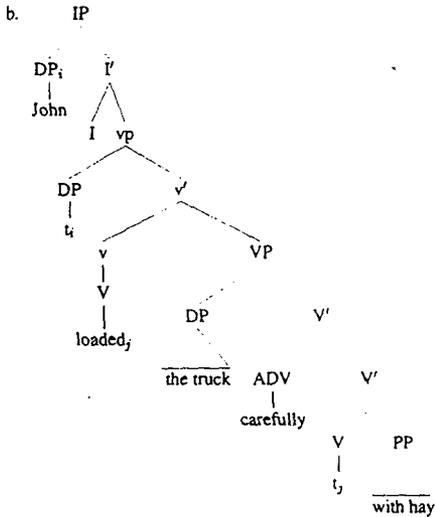
English allows certain adverbs to occur between the direct object and a directional argument, as *gently* does in (151a) and *carefully* in (151b). Under the assumption that adverbs are adjuncts, Radford argues that adverb placement can be easily explained under the more articulated structure of a verb phrase, such as the one proposed by Larson (1988) involving a VP shell. This analysis provides the appropriate place in the string for adverb adjunction: the V' , as shown in (152). Thus, under these assumptions adverb placement can test for V' positions within the verb phrase.

(151) a. John deliberately rolled the ball gently down the hill.

b. John loaded the truck carefully with hay.

(152) a. IP





In English, adverbs cannot be inserted between a verb and a direct object and the same is true of Serbo-Croatian. Its most natural placement in Serbo-Croatian is before the verb as in (153). This adverb placement is compatible with neutral intonation and consequently does not require prosodic prominence on the adverb.

- (153) a. Jovan je oprezno/brzo dao Mariji vino.
 Jovan.NOM AUX carefully/quickly gave Marija.DAT wine.ACC
 'Jovan gave Mary carefully the wine.'

- b. Jovan potpuno/skoro zapostavlja/pomaže Petra.
 Jovan.NOM completely/almost ignores/helps Petar.ACC/DAT
 'Jovan completely/almost ignores/helps Petar.'

The analysis proposed by Radford for English works for Serbo-Croatian only when the second argument is a PP. Serbo-Croatian differs from English in that certain adverbial modifiers are not PPs but dative or instrumental NPs. That is, they differ categorially from the ones in English. Serbo-Croatian data show that when the directional argument is not a PP, the adverb placement between the two arguments is not possible. Consider the Serbo-Croatian analogs of (151) in (154). When the second argument is expressed as an instrumental NP rather than a PP, as in (154b), the adverb cannot intervene between the two arguments. To show that this pattern is general for VP adverbs, I provide some additional examples in (155) and (156).

- (154) a. Petar je namerno kotrljao loptu pažljivo niz brdo.
 Petar.NOM AUX deliberately rolled ball.ACC gently down hill
 'Petar deliberately rolled the ball gently down the hill.'

- b. *Petar je natovario kamion oprezno senom.
 Petar.NOM AUX loaded truck.ACC carefully hay.INST.
 'Petar loaded the truck carefully with hay.'

- (155) a. *Jovan je dao Mariji oprezno/brzo vino.
 Jovan.NOM AUX gave Marija.DAT carefully/quickly wine.ACC
 'Jovan gave Mary carefully the wine.'

b. *Jovan je dao vino oprezno/brzo Mariji.
Jovan.NOM AUX gave wine.ACC carefully/quickly Marija.DAT
'Jovan gave the wine carefully to Mary.'

(156) a. *Jovan je govorio Francuski intimno Mariji.
Jovan.NOM AUX spoke French intimately Marija.DAT
'Jovan spoke French intimately to Mary.'

b. *Jovan je govorio Mariji intimno Francuski.
Jovan.NOM AUX spoke Marija.DAT intimately French
'Jovan spoke French intimately to Mary.'

So far, we have evidence that when the arguments are NPs there is no position available for adverbs between the two arguments. The next thing to consider is to see whether an adverb can occur in between a verb and the two arguments.

(157) a. Jovan je dao oprezno/brzo Mariji vino.
Jovan.NOM AUX gave carefully/quickly Marija.DAT wine.ACC
'Jovan gave Mary carefully the wine.'

b. Jovan je dao oprezno/brzo vino Mariji.
Jovan.NOM AUX gave carefully/quickly wine.ACC Marija.DAT
'Jovan gave the wine carefully to Mary.'

(158) a. Jovan je govorio intimno Francuski Mariji.
Jovan.NOM AUX spoke intimately French Marija.DAT
'Jovan intimately spoke French to Mary.'

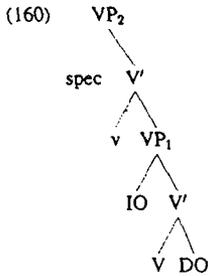
- b. Jovan je govorio intimno Mariji Francuski.
 Jovan.NOM AUX spoke intimately Marija.DAT French
 'Jovan intimately spoke French to Mary.'

The structures in (157) and (158) are markedly better than the ones in (155) (156). The Serbo-Croatian facts are just the opposite of what we find in English as shown in (159) (from Bowers, 1993, p.609).

- (159) a. John spoke French intimately to Mary.
 b. *John spoke intimately Frech to Mary.

Both Bowers and Radford assume that adverbs in English are adjoined to X' . Given that English and Serbo-Croatian differ in adverb placement, the same solution cannot work for both. The pattern of adverb placement in Serbo-Croatian ditransitive structures could be explained if we assume that adverbs can only be adjoined to a maximal projection, rather than a V' . If the adverb could be adjoined to a V' then we would expect the adverb to be able to occur between the two objects, just as in English.

The ability to position adverbs within a verb phrase in Serbo-Croatian seems to suggest that the two internal arguments, as in the case of ditransitive verbs, behave as if they constitute a constituent of some kind. Under the VP-shell hypothesis, shown in (160), the two internal arguments are grouped as a constituent after the verb raises to a higher head position. The " v " is the higher head position for the light verb or the shell over the core VP to which the main verb, " V ", moves to.



VP₁ can function as the adjunction target for adverbs. The VP shell proposal was Larson's solution to the binding facts of double object constructions in English, which allow us to encode that fact that the indirect object c-commands the direct object. We have seen that the ordering of the two arguments in a ditransitive structure is free and that the binding is possible in both structures from the argument on the left into the argument to its right. Adopting a VP shell for Serbo-Croatian would then require that the arguments be freely generated in either position and the verb can either move to "v" or stay in situ.

If adverb placement in ditransitive structures allows the verb to be separated from its argument, due to verb raising, what happens in monotransitive structures with respect to adverb placement? The examples in (161) show that an adverb cannot intervene between the verb and its argument.

- (161) a. *Jovan je zapostavljao potpuno/dugo Petra.
 Jovan.NOM AUX ignored completely/long Petar.ACC
 'Jovan ignored completely/long Petar.'

- b. *Jovan je pokvario potpuno/brzo igračku .
 Jovan.NOM AUX ruined completely/brzo toy.ACC
 'Jovan ruined completely/fast a/the toy.'

We cannot explain the failure of adverbs to occur between the verb and its complement by an adjacency requirement for the verb and its complement for the purpose of Case assignment/checking because, we are claiming that the arguments in general need not be adjacent to the verb and consequently that Case checking/assignment does not play a role in determining the word order in Serbo-Croatian. Serbo-Croatian is a scrambling language and any ordering of major constituents is possible, including those in which the verb and the argument are not adjacent.

It is interesting however, that examples like (161) improve if the direct object NP is branching, as (162) shows. This suggests, that the ungrammaticality of (161) is due to lack of phonological weight of the direct object and not to syntactic constraints on adjacency between the verb and its complement. The presence of two objects in ditransitive structures then is consistent with this phonological requirement.

- (162) a. Jovan je zapostavljao potpuno/dugo svakog pacijenta.
 Jovan.NOM AUX ignored completely/long every.ACC patient
 'Jovan ignored completely/long every patient.'
- b. Jovan je pokvario potpuno/brzo svaku novu igračku .
 Jovan.NOM AUX ruined completely/brzo everyACC newACC toy.ACC
 'Jovan ruined completely/fast every new toy.'

A similar phonological constraint on topicalized phrases has been argued for by Zec and Inkelas (1990). They argue that there is phonological requirement on topic phrases in Serbo-Croatian topic construction which allows only constituents which instantiate a branching phonological phrase¹¹ to occur in the topic position. They point out the contrast in (163). The syntactic structure is the same in both sentences and yet only (163a) is acceptable.

- (163) a. Taj čovek voleo je Mariju.
 that.NOM man.NOM loved AUX Marija.ACC
 'That man loved Mary.'
- b. *Petar voleo je Mariju.
 Petar.NOM loved AUX Marija.ACC
 'Petar loved Mary.'

Thus, given that an independent phonological constraint accounts for the inability of adverbs to intervene between the verb and its argument in monotransitive structures, the hypothesis that adverbs in Serbo-Croatian adjoin to an XP, rather than a X' can be maintained across both types of transitive structures. In addition the adverb placement facts argue that there is internal structure to verb phrase in Serbo-Croatian.

Summary: In this section I have shown that under standard syntactic assumptions, Serbo-Croatian has configurational structure both at the IP level and the VP level. Evidence for the configurational structure at the IP level comes from evidence for a syntactic VP

¹¹The constituent they call a phonological phrase does not have a direct correspondence to any of the prosodic constituents posited in Chapter 3. Their possible relationship is yet to be established.

constituent and on the basis of subject/object asymmetries. Evidence for a configurational VP comes from adverb placement facts.

4.3 Constituent Permutation: A- or A'-Movement

4.3.1 Canonical Constituent Order

In this section we consider sentences that can be characterized as deviating from the canonical word order. Traditional grammars claim that Serbo-Croatian is an *SVO* language or to be more precise an *S.V.IO.DO* language. However, the constituent order is not rigid and we regularly find sentences with constituents that have been permuted. Despite the widespread use of sentences with non-canonical constituent ordering, sentences that deviate from the canonical word order are felt by native speakers to be marked.

In Chapter 5 we will see that canonical word order is compatible with many focus structures, including broad sentence focus (i.e. allow focus projection under neutral intonation). Focus projection possibilities entail compatibility with a variety of contexts and most crucially with the so-called out-of-the-blue context, a context with a minimal set of relevant shared assumptions among the interlocutors. Consequently, we can argue that canonical orderings are considered canonical because of their compatibility with a wider range of contexts.

As we mentioned at the beginning of this chapter, syntactically, the canonical ordering could be and often is identified with the underlying order (i.e. D-structure order) which is driven by theory internal consideration and the principle of syntactic elegance. For example, in the theoretical framework of Kayne (1994) all languages are underlyingly *SVO*

and their surface order is a product of different feature strength of functional heads which trigger movement. We will see in Chapter 5 that the claim that Serbo-Croatian is an SVO language is a claim that rests on a different type of evidence. It is based on evidence from pragmatics, that is, generalizations about the constituent ordering and their compatibility with different contexts. When we consider this type of evidence, Serbo-Croatian may also be argued to be a VSO language, since this ordering also allows focus projection (i.e. focus ambiguity). Using a similar reasoning Holloway-King (1995) argues that Russian, which is thought of as an SVO language from a typological perspective, is actually a VSO language. The SVO orders resulting from demands of most types of discourse for a topic. In Chapter 5, I will argue that it is the ordering of nominal arguments within the VP that is relevant for focus projection. In the meantime we will discuss the possibilities and syntactic consequences of non-canonical constituent orders.

4.3.2 Non-canonical Constituent Orders

In order to investigate the properties of non-canonical structures we will look at embedded clauses. The reason for this is to also be able to show possibilities of non-local displacement.

To begin with, consider the examples in (164). The sentence in (164a) is the canonical structure, whereas all the others exemplify a non-canonical placement of one constituent, the direct object of the subordinate clause. Each subsequent sentence has the direct object displaced from its canonical position (after its governing verb in the subordinate clause) higher up in a sentence. In (164b) it immediately precedes the verb; in (164c) it precedes the lower subject; in (164d) it precedes the complementizer; in (164e) it precedes the main

verb (this placement is ungrammatical); and in (164f) it occurs at the front of the matrix clause. Thus, the set of sentences in (164) illustrates all the logical possibilities for the placement of the direct object of a subordinate clause. The generalization that emerges from this example is that the argument of a lower clause cannot mix with the arguments of the higher clause.

(164) a. Njegova_i mama sumnja da je
 his.NOM mother.NOM doubts that AUX
 Marija prevarila svakog_i umetnika.
 Marija.NOM cheated every.ACC artist.ACC
 'His mother doubts that Mary cheated every artist.'

b. Njegova_i mama sumnja da je
 his.NOM mother.NOM doubts that AUX
 Marija svakog_i umetnika prevarila.
 Marija.NOM every.ACC artist.ACC cheated
 'His Mother doubts that Mary cheated every artist.'

c. Njegova_i mama sumnja da je
 his.NOM mother.NOM doubts that AUX
 svakog_i umetnika Marija prevarila.
 every.ACC artist.ACC Marija.NOM cheated
 'His mother doubts that Mary cheated every artist.'

d. Njegova_i mama svakog_i umetnika
 his.NOM mother.NOM doubts every.ACC artist.ACC
 da je Marija prevarila.
 that AUX Marija.NOM cheated
 'His mother doubts that Mary cheated every artist.'

e. *Njegova mama svakog umetnika sumnja
 his.NOM mother.NOM every.ACC artist.ACC doubts
 da je Marija prevarila.
 that AUX Marija.NOM cheated
 'His mother doubts that Mary cheated every artist.'

f. Svakog_i umetnika njegov_i mama sumnja
 every.ACC artist.ACC his.NOM mother.NOM doubts
 da je Marija prevarila.
 that AUX Marija.NOM cheated
 'His mother doubts that Mary cheated every artist.'

What is of interest to us here is the following: What are the structures of these non-canonical word orders? We can begin to answer this question by first trying to discern the properties of each of the positions that the direct object of the lower clause can occupy.

First we want to identify all the positions that the direct object of the lower clause can occur in, other than its canonical position (after the verb). For this purpose we will assume

that when the object doesn't occur in its canonical position it has moved and adjoined to some other (non-argument) category.¹²

- (164)(b) adjunction to lower VP
- (164)(c) adjunction to lower IP
- (164)(d) adjunction to lower CP
- (164)(e) adjunction to matrix VP
- (164)(f) adjunction to matrix IP

Table 4.1: Assumed positions for the displaced direct object in sentences in (164)

A standard division of syntactic positions in Government and Binding and Principles and Parameters frameworks (Chomsky, 1981, 1985, 1986) has been into A and A' positions. A-positions are argument positions to which structural Case is assigned, i.e. subject and object positions – depending on the type of the predicate. A'-positions are non-argument positions to which neither Case nor θ -role are assigned. One of distinguishing properties of these positions relevant for our purposes is their binding potential for phrases that occupy them. Phrases that occupy A-positions can bind anaphors (reflexives and reciprocals) (A-binding), whereas phrases that occupy A' positions cannot. Adjoined positions are by definition A' positions.

¹²Adjunction is a process in which the adjoined category creates a new mother node with the same label of the category to which it is adjoined.

In the Minimalist framework these notions have been redefined given that Case assignment is reanalyzed as feature checking in the spec-head configuration of the functional layer above the lexical projections. The positions of functional categories related to the morphological properties of the lexical category are called L-related positions. Thus, the notion of an A-position can now be construed as the L-related position. I will retain the nomenclature of A vs. A' distinction, assuming that the translation into the Minimalist version is trivial.

In order to interpret the results from this test as applied to the sentences in (165) one needs to assume that an anaphor (a reciprocal in this case) must be c-commanded by its antecedent in an A-position. This is clearly the case in (165a) and (165b). However, that is not the case in (165c), where the anaphor precedes the subject and we have assumed that it is adjoined to IP. The interesting fact is that interpretation of the anaphor fails in (165c) but it is possible in (165d) and (165f) where the anaphor precedes its antecedent. This cannot be explained by linear precedence alone, but must refer to the type of the position of the binder. What this seems to show is that reconstruction (undoing the movement at LF) is not possible from IP adjoined position, but it is possible from the embedded CP adjoined position and from the matrix IP adjoined position.

- (165) a. Marija sumnja da su Petar
 Marija.NOM doubts that AUX Petar.NOM
 i Jelena videli jedno drugo.
 and Jelena.NOM saw each other
 'Mary doubts that Petar and Jelena saw each other.'

- b. Marija sumnja da su Petar
 Marija.NOM doubts that AUX Petar.NOM
 i Jelena jedno drugo videli.
 and Jelena.NOM each other saw
 'Mary doubts that Petar and Jelena saw each other.'
- c. *Marija sumnja da su jedno
 Marija.NOM doubts that AUX each
 drugo Petar i Jelena videli.
 other Petar.NOM and Jelena.NOM saw
 'Mary doubts that Petar and Jelena saw each other.'
- d. Marija sumnja jedno drugo da
 Marija.NOM doubts each other that
 su Petar i Jelena videli.
 AUX Petar.NOM and Jelena.NOM saw
 'Mary doubts that Petar and Jelena saw each other.'
- e. *Marija jedno drugo sumnja da
 Marija.NOM each other doubts that
 su Petar i Jelena videli.
 AUX Petar.NOM and Jelena.NOM saw
 'Mary doubts that Petar and Jelena saw each other.'

f. Jedno drugo Marija sumnja da
 each other Marija.NOM doubts that
 su Petar i Jelena videli.
 AUX Petar.NOM and Jelena.NOM saw
 'Mary doubts that Petar and Jelena saw each other.'

Now, we have to test in reverse. We need to look at how the position of the antecedent affects the binding of an anaphor. We will therefore look at an example in which both the antecedent and the anaphor are inside the VP (since anaphors cannot be subjects).

The anaphor binding facts exemplified in the paradigm shown in (166) illustrate that the scrambled direct object can bind the dative anaphor, as long as it precedes it at the surface.¹³ This seems to argue that all adjunct positions can function as A-positions with respect to anaphor binding.

(166) a. *Marija sumnja da je direktor
 Marija.NOM doubts that AUX boss.NOM
 predstavio jedne drugima studente.
 introduced each other.DAT students.ACC
 'Mary doubts that the boss hasn't introduced the students to each other.'

¹³We can exclude the example in (166f) as being ungrammatical not due to the binding facts but due to movement constraints. As in German, long-distance scrambling in Serbo-Croatian is generally not very good.

- b. Marija sumnja da je direktor
 Marija.NOM doubts that AUX boss.NOM
 predstavio studente jedne drugima.
 introduced students.ACC each other.DAT
 'Mary doubts that the boss has introduced the students to each other.'
- c. Marija sumnja da je direktor
 Marija.NOM doubts that AUX boss.NOM
 studente predstavio jedne drugima.
 students.ACC introduced each other.DAT
 'Mary doubts that the boss has introduced the students to each other.'
- d. Marija sumnja da je studente
 Marija.NOM doubts that AUX students.ACC
 direktor predstavio jedne drugima.
 boss.NOM introduced each other.DAT
 'Mary doubts that the boss has introduced the students to each other.'
- e. Marija sumnja studente da je
 Marija.NOM doubts students.ACC that AUX
 direktor predstavio jedne drugima.
 boss.NOM introduced each other.DAT
 'Mary doubts that the boss has introduced the students to each other.'

f. *Marija studente sumnja da je
 Marija.NOM students.ACC doubts that AUX
 direktor predstavio jedne drugima.
 boss.NOM introduced each other.DAT
 'Mary doubts that the boss has introduced the students to each other.'

g. Studente Marija sumnja da je
 students.ACC Marija.NOM doubts that AUX
 direktor predstavio jedne drugima.
 boss.NOM introduced each other.DAT
 'Mary doubts that the boss has introduced the students to each other.'

A'-movement has also been characterized with having a property of reconstruction. That is, the element whose surface position is an A'-position does not get interpreted in that position, but it is rather reconstructed to the position of its trace at LF. One possible test for reconstruction is quantifier scope. If a quantifier has the same scope in scrambled and canonical position then its scope is not read off of the surface position. In other words, no change in quantifier scope with surface displacement implies reconstruction. Our example (164f) provides us with evidence that the quantified NP *svakog umetnika* 'every artist' in the matrix clause fronted position can bind the pronoun *njegova* 'his' within the subject NP of the matrix clause. This is a well-known example of Weak Crossover (WCO)¹⁴ amelioration

¹⁴Weak Crossover is a configuration in which the pronoun is to the left of the trace of its potential binder. That is, [Q_i ... pronoun ... t_i]. In this configuration the quantifier cannot bind the pronoun in English, as in: **Who_i does his_i mother love t_i?* The binding of the pronoun in the subject position by *who* is impossible in English. However, most scrambling languages do not prohibit this configuration.

prevalent in languages that allow scrambling, such as German, Hindi, Japanese, and others. For a quantifier to bind the pronoun it must be in an A-position. This leads us to conclude that fronting of the quantifier must be an A-movement.

Under the assumption that the bound-variable reading of a pronoun is subject to the binding condition, i.e., c-command, and that a quantifier can bind a variable in its scope, then quantifier scope is identical to its c-command domain. This makes a prediction that the scope of the quantifier is read off of its surface position. Given that the sentence in (164e) has only one quantified expression, we are not in a position to ascertain this prediction. We must look at an example which has at least two quantified NPs. Consider (167).¹⁵

- (167) Svakog umetnika neka žena sumnja
 every.ACC artist.ACC some.NOM woman.NOM doubts
 da je Marija prevarila.
 that AUX Marija.NOM cheated
 'Some woman doubts that Mary cheated every artist.'
 some woman > every artist *every artist > some woman

(167) has a quantified NP in the position of the matrix subject which has the potential to interact with the fronted quantified NP from the object position of the lower clause. However, the fronted quantifier has obligatorily narrow scope with respect to the subject of the matrix clause. The only possible reading is the one in which there is a single woman that doubts that Mary cheated every artist. The reading in which for every artist there is

¹⁵I represent the scope relations between two quantified expressions by '>' sign. The QP on the left has wider scope than the QP on the right.

some woman who doubts that Mary cheated him is not available. This means that the reconstruction of the movement is necessary. If so, that means that we are dealing with an A'-movement, since only A' movements undergo reconstruction.

But, this conclusion is puzzling given that we have just seen that fronting of the quantifier to the left of the matrix subject ameliorates Weak Crossover effect, which led us to conclude that the quantifier was in an A-position. So, to summarize, on the basis of the example in (164e), we have conflicting results. With respect to pronoun binding, the fronted position counts as an A-position; with respect to the quantifier scope interaction, the fronted position counts as the A' position.

Another test for A-movement is the idiom chunk test: a part of an idiom can move to an A-position and still preserve the meaning of the idiom. In English, subject-to-subject raising is A-movement, whereas topicalization is A' movement. They differ in the way they allow the idiomatic meaning to be preserved: the raising construction has the idiomatic meaning, whereas the topicalized version does not. This is shown in (168). Only in (168a) is the idiomatic reading preserved.

(168) a. [The shit_t seems [t_i to have hit the fan.]] – raising

b. The shit Mary denies has hit the fan. – topicalization

We can apply the idiom chunk test to the same set of positions we were concerned about in example (164). The idiom we will consider is *pobrkati lončiče* with the literal meaning of 'mix the pots', and the idiomatic meaning 'get confused'. The prediction is that the A-positions will preserve the idiomatic meaning, whereas the A' positions will not. In (169) I list the results.

- (169) a. Petar sumnja da je Marija pobrkala lončiče.
 Petar.NOM doubts that AUX Marija.NOM mixed pots.ACC
 'Petar doubts that Mary got confused.'
 'Petar doubts that Mary mixed the pots.'
- b. Petar sumnja da je Marija lončiče pobrkala.
 Petar.NOM doubts that AUX Marija.NOM pots.ACC mixed
 ? 'Petar doubts that Mary got confused.'
 'Petar doubts that Mary mixed the pots.'
- c. Petar sumnja da je lončiče Marija pobrkala.
 Petar.NOM doubts that AUX pots.ACC Marija.NOM mixed
 *'Petar doubts that Mary got confused.'
 'Petar doubts that Mary mixed the pots.'
- d. Petar sumnja lončiče da je Marija pobrkala.
 Petar.NOM doubts pots.ACC that AUX Marija.NOM mixed
 *'Petar doubts that Mary got confused.'
 'Petar doubts that Mary mixed the pots.'
- e. *Petar lončiče sumnja da je Marija pobrkala.
 Petar.NOM pots.ACC doubts that AUX Marija.NOM mixed
 *'Petar doubts that Mary got confused.'
 **'Petar doubts that Mary mixed the pots.'

f. Lončiće Petar sumnja da je Marija pobrkala.

pots.ACC Petar.NOM doubts that AUX Marija.NOM mixed

*'Petar doubts that Mary got confused.'

'Petar doubts that Mary mixed the pots.'

The sentence in (169a) has the direct object in its canonical position, following the verb. With the direct object in this position, the sentence has two readings: the literal reading and an idiomatic reading. (169b) has the direct object immediately preceding the verb, and the judgment about the idiomatic reading is very insecure, it fades in and out for me and my informants, and hence the question mark. The judgments for all the rest of the sentences are very clear, they only have the literal meaning. (169e) is ungrammatical on both readings because long-distance scrambling is just not very good in Serbo-Croatian, although judgments may vary. What this test shows us then is that except for the lower VP adjunction position, for which the judgments can go either way, all the positions are A' positions.

Another well-known test for A' positions is the parasitic gap test. A parasitic gap (pg) is a construction which involves a gap bound by a filler of another gap, as in (170). Parasitic gaps are only licensed when the filler is in an A' position. Serbo-Croatian also has the parasitic gap construction,¹⁶ and thus we can use it to test the positions that allow adjunction.

(170) What_t did you file t_i without reading pg_i.

¹⁶Parasitic gaps are marginal in Serbo-Croatian in a similar way to English. Some informants invariably insert a resumptive pronoun in the position of the parasitic gap, whereas others accept parasitic gap constructions without a problem.

- (171) a. *Marija sumnja da je Petar pojeo jabuku,
 Marija.NOM doubts that AUX Petar.NOM ate.PERF apple.ACC
 a da nije oprao.
 but that not.AUX washed.PERF.
 'Mary doubts that Petar ate the apple without having washed it.'
- b. Marija sumnja da je Petar jabuku pojeo,
 Marija.NOM doubts that AUX Petar.NOM apple.ACC ate.PERF
 a da nije oprao.
 but that not.AUX washed.PERF.
 'Mary doubts that Petar ate the apple without having washed it.'
- c. Marija sumnja da je jabuku Petar pojeo,
 Marija.NOM doubts that AUX apple.ACC Petar.NOM ate.PERF
 a da nije oprao.
 but that not.AUX washed.PERF.
 'Mary doubts that Petar ate the apple without having washed it.'
- d. Marija sumnja jabuku da je Petar pojeo,
 Marija.NOM doubts apple.ACC that AUX Petar.NOM ate.PERF
 a da nije oprao.
 but that not.AUX washed.PERF.
 'Mary doubts that Petar ate the apple without having washed it.'

e. ?Marija jabuku sumnja da je Petar pojeo.
 Marija.NOM apple.ACC doubts that AUX Petar.NOM ate.PERF
 a da nije oprao.
 but that not.AUX washed.PERF.
 'Mary doubts that Petar ate the apple without having washed it.'

f. Jabuku Marija sumnja da je Petar pojeo,
 apple.ACC Marija.NOM doubts that AUX Petar.NOM ate.PERF
 a da nije oprao.
 but that not.AUX washed.PERF.
 'Mary doubts that Petar ate the apple without having washed it.'

Sentences in (171) show that it is possible to have a parasitic gap in the adjunct clause only when the direct object is not in its canonical position. So, (171a) is ungrammatical because the parasitic gap in the adjunct clause cannot be licensed by the direct object in the A-position. The sentence in (171b-f) are markedly better since the direct object is not in its canonical position. Under the assumption that parasitic gaps are only licensed from A' positions (see inter alia Engdahl, 1983; Cinque, 1990), this means that the relevant adjoined positions must be A' positions. The parasitic gap test and the idiom chunk test provide consistent results with respect to all positions. There is a minor discrepancy for the adjunction to the lower VP position. Whereas the judgments about the idiomatic meaning are not very clear, the judgments about the parasitic gap are much sharper.¹⁷

¹⁷ Although these judgments reflect only discrete distinctions between grammatical and ungrammatical, it would be more accurate to say that there is a gradation of judgments. While the intermediate positions are

The results of our tests are summarized in Table 4.2. The tests converge on the following fact: positions outside the minimal IP behave as A' positions; whereas positions within the minimal IP behave as A-positions. This is similar to Japanese as argued by Miyagawa (1997). There seems to be a difficulty assessing the properties of positions at the boundaries. The judgments are not secure. For example, idiomatic meanings are sensitive to the VP boundary, whereas anaphoric binding is sensitive to CP boundary. This situation seems to point out that non-canonical positions do not have absolute properties but are relative to a purpose for which they are evaluated, such as binding, scope, or idiomatic collocations. The fact that is relevant for the purpose of focus projection, to be discussed in Chapter 5, is the fact that (lower) VP-adjoined position has properties of an A-position, or argument position. We will use this fact, as supporting evidence to argue that VP internal arguments can be base-generated in either order.

Together with the canonical ordering and the summary in Table 4.2, we have only investigated three types of word order: SVO, SOV, OSV. In order to examine the full range of possibilities of constituent ordering in Serbo-Croatian monotransitive clauses, we still need to discern the patterns and structures for VSO, VOS, and OVS orderings.¹⁸ For this purpose we will only look at the idiom chunk test and the parasitic gap test. We first look at the idiom test.

acceptable in comparison to the canonical argument position, which is clearly not, the left-most position (fronting to the matrix IP) is also clearly better than the intermediate positions. The current theory has no way of dealing with this type of differences in judgments.

¹⁸The number of possible patterns of constituent ordering grows exponentially by increasing the number of constituents. We will look at ditransitive clauses in chapter 5.

Tests	Matrix IP	Matrix VP	Lower CP	Lower IP	Lower VP
Anaphor binding	A	A'	A	A	A
WCO amelioration	A	A'	A	A	A
Reconstruction	A'	A	A'	A	A
Idioms	A'	A'	A'	A'	A?
PGs	A'	A	A'	A'	A

Table 4.2: Summary of the test results. The positions indicate the movement landing site. The A vs. A' distinction shows the properties a particular position has with respect to the applied test.

(172) a. Marija sumnja da je pobrkao Petar lončiče.

Marija.NOM doubts that AUX mix Petar.NOM pots.ACC

'Marija doubts that Petar mixed the pots.'

*'Marija doubts that Petar got confused.'

b. Marija sumnja da je pobrkao lončiče Petar.

Marija.NOM doubts that AUX mix pots.ACC Petar.NOM

'Marija doubts that Petar mixed the pots.'

?'Marija doubts that Petar got confused.'

- c. Marija sumnja da je lončiče pobrkao Petar.
 Marija.NOM doubts that AUX pots.ACC mix Petar.NOM
 'Marija doubts that Petar mixed the pots.'
 ?'Marija doubts that Petar got confused.'
- d. Marija sumnja lončiče da je pobrkao Petar.
 Marija.NOM doubts pots.ACC that AUX mix Petar.NOM
 'Marija doubts that Petar mixed the pots.'
 **'Marija doubts that Petar got confused.'
- e. *Marija lončiče sumnja da je pobrkao Petar.
 Marija.NOM pots.ACC doubts that AUX mix Petar.NOM
 **'Marija doubts that Petar mixed the pots.'
 **'Marija doubts that Petar got confused.'
- f. Lončiče Marija sumnja da je pobrkao Petar.
 Marija.NOM pots.ACC doubts that AUX mix Petar.NOM
 'Marija doubts that Petar mixed the pots.'
 **'Marija doubts that Petar got confused.'

The word orders in (172) complete the inventory of possible permutations of major clausal constituents in a monotransitive clause. In (172), we have the remaining patterns: VSO, VOS, and OVS. The crucial point to notice is that in all of them, the verb precedes the subject.¹⁹ As the coding of the translations show, the idiomatic readings are impossible

¹⁹These word orders are very marked. They require special contextualization if they were to occur either as a subordinate or a main clause. Verb-initial main clauses are often found at the beginnings of a story

to get in most of the examples. There are only two in which it is possible to construe the idiomatic meaning; in both cases, the idiomatic reading is possible only if the utterance counts as a repetition of a previous utterance which established the idiomatic meaning. Thus, adjacency between the verb and its complement is essential for idiom preservation.

We now move to the parasitic gap test.

(173) a. *Marija sumnja da je pojeo Petar jabuku.

Marija.NOM doubts that AUX ate Petar.NOM apple.ACC

a da nije oprao.

and that not.AUX washed

'Mary doubts that Petar ate an apple without washing it.'

b. ?*Marija sumnja da je pojeo jabuku Petar,

Marija.NOM doubts that AUX ate apple.ACC Petar.NOM

a da nije oprao.

and that not.AUX washed

'Mary doubts that Petar ate an apple without washing it.'

telling or a joke. Verb-initial subordinate clauses are more likely to occur as repetitions of a previous utterance.

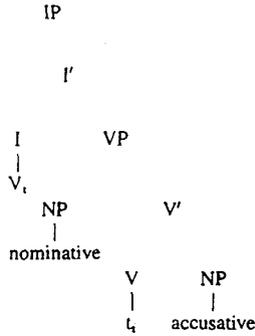
- c. ?*Marija sumnja da je jabuku pojeo Petar,
 Marija.NOM doubts that AUX apple.ACC ate Petar.NOM
 a da nije oprao.
 and that not.AUX washed
 'Mary doubts that Petar ate an apple without washing it.'
- d. ?*Marija sumnja jabuku da je pojeo Petar,
 Marija.NOM doubts apple.ACC that AUX ate Petar.NOM
 a da nije oprao.
 and that not.AUX washed
 'Mary doubts that Petar ate an apple without washing it.'
- e. ?*Marija jabuku sumnja da je pojeo Petar,
 Marija.NOM apple.ACC doubts that AUX ate Petar.NOM
 a da nije oprao.
 and that not.AUX washed
 'Mary doubts that Petar ate an apple without washing it.'
- f. ?*Jabuku Marija sumnja da je pojeo Petar,
 apple.ACC Marija.NOM doubts that AUX ate Petar.NOM
 a da nije oprao.
 and that not.AUX washed
 'Mary doubts that Petar ate an apple without washing it.'

A note on the above sentences in (173) is in order. They seem to work only if the prominence is on the verb in the embedded clause. If the prominence falls on the subject, as it does in the neutral intonation pattern, the subject is in focus, and the sentences are pragmatically odd. This makes it difficult to judge whether the parasitic gap construction is good, since the two clauses seem to have incongruent information structures. Putting prominence on the verb improves the pragmatic condition on the relevance of the adjunct clause, since the focus in the adjunct clause is on the verb as well. That is, the pragmatic condition on the adjunct clause containing the parasitic gap seems to be focus parallelism with the main clause. Once we control for this variable, the '*' sentences, (173b-f), improve showing that the parasitic gap is licensed in the adjunct clause. This suggests that the landing site of the direct object must be an A' position.

The two tests we have considered for VS orders above strongly suggest that the direct object occurs in an A-position only when it is positioned after the subject. All the other positions seem to be A' positions. We will see in Chapter 5 that OV structures, where O and V are string adjacent, allow focus projection: for the purpose of accounting for focus projection facts it is preferable to allow these structures to function as de facto base generated.

Verb initial structures can be generated by adopting the VP-subject-internal hypothesis, allowing the subject to stay in situ, while the verb moves to the left. This analysis assumes the following structure of a main clause:

(174)



In order to provide a unified structural analysis for all the possible word orders, movement has to be optional, or driven by some, yet undiscovered, principle(s). Scrambling has been linked to focus in a number of languages: Japanese (Miyagawa, 1997), Spanish (Zubizarreta, 1998), Hungarian (Kiss, 1995), Catalan (Vallduví, 1992), Hindi (Kidwai, 2000), etc. Focus cannot be analyzed to motivate all movement in Serbo-Croatian, because, as I have shown in Chapter 3, prosodic prominence can be placed on any constituent in a sentence, even for sentences with a scrambled word order, making the prominent constituent be interpreted as focused. Focus could be considered to motivate movement only in neutral prosodic conditions, where the prominence is at the edge of the phrase. In this condition there are two possible ways to look at scrambling: (i) either the focused syntactic unit moves to align with the right edge and thus receive prosodic prominence, or (ii) the non-focused constituents move away from the right edge to avoid being prominent and thus in focus. Zubizarreta (1998) and Vallduví (1992) argue that Spanish and Catalan word order favors the second alternative, i.e., moving out of focus. German scrambling is also

assumed to operate in terms of avoiding focus. However, Kiss (1995) and Kidwai (2000) argue that in Hungarian and Hindi, scrambling is in the function of the first alternative, i.e. focusing. In Chapter 5, I will argue that scrambling under the neutral intonation pattern can be viewed as moving out of focus. However, under non-neutral prosodic conditions, scrambling must be thought of in service of other types of discourse functions, such as cohesiveness between utterances and centering (see Grosz and Sidner, 1986).

4.3.3 Scrambling or Topicalization?

Permutation of clausal constituents in languages that allow this operation. Japanese, Hindi, Korean, Hungarian, Russian, German, etc., has been analyzed as scrambling. A number of languages, such as English, that do not allow scrambling, do allow sentence preposing of clausal constituents. This operation, known as topicalization, is thought of as being different from scrambling. In the previous section we have looked at constituent permutation in somewhat pretheoretical terms in the sense that we were not trying to discern whether different orderings of clausal constituents are the result of scrambling or topicalization. Instead, we have treated the structures with non-canonical constituent order as simply derived from the canonical structures by a movement operation. In this section we will address the question of whether there is a single movement operation, or whether there may be different types of movement operations.

Following Ross (1967), scrambling is often thought of as being clause bounded. That is, constituent permutation is allowed only within the constituent's clause. Thus, only adjunctions to the VP and IP within the clause count as scrambling. German is a language that can be used to illustrate this point, shown in (175).

(175) examples from Grewendorf and Sternefeld (1990)

a. daß den Max jeder kennt.
that ART.ACC Max everyone knows
'that everyone knows Max.'

b. *weil den Max ich glaube daß jeder kennt.
because ART.ACC Max I believe that everyone knows
'because I believe that everyone knows Max.'

(175b) is ungrammatical because the direct object of the embedded clause, *den Max*, has been moved outside its clause. The direct object, however, can be moved from its canonical position within the same clause, as the grammaticality of (175a) proves.

In the previous section, we have seen that in Serbo-Croatian, this is not the case: constituents from a lower clause can occur in a higher clause. If scrambling is clause bound, then adjunctions to CP, and other nodes in a higher clause must be of a different nature. Are there any properties that could distinguish these two types of positions, and thus justify a distinction between movements of different boundedness? In what follows I discuss some tests that have been used to distinguish the two, and conclude that Serbo-Croatian does not provide compelling evidence for the distinction.

We have seen that all positions, except the canonical one, license parasitic gaps. Therefore this test does not discriminate between scrambling and topicalization. The same is true of weak crossover amelioration. The idiom chunk test seems to show some sensitivity to internal to the clause vs. external to the clause, although the judgments are not sharp enough to be reliable. The only test that seems to favor clause boundedness distinction is anaphor binding.

Some other generalizations about scrambling discussed by Grewendorf and Sternefeld (1990) include the claim that scrambling cannot apply to *wh*-phrases nor to focused phrases. However, neither of these claims are true of Serbo-Croatian. We have already seen that a focused verb can be in its non-canonical position, and this is also true of any other constituent, as we will see in Chapter 5. As far as *wh*-phrases are concerned, I believe that the fact that fronted *wh*-phrases can occur in any order (as we have shown earlier, i.e., there is no superiority effect) serves as evidence that they can be scrambled. This point can be further amplified by the examples in (176) which show that any ordering of the *wh*-elements is acceptable.

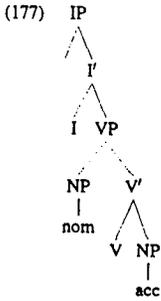
- (176) a. Ko kome šta gde daje?
 who.NOM who.DAT who.ACC where gives
 'Who is giving what to whom where?'
 b. Kome šta ko gde daje?
 who.DAT who.ACC who.NOM where gives
 c. Gde kome šta ko daje?
 where who.DAT who.ACC who.NOM gives
 d. Šta kome ko gde daje?
 e. Šta ko kome gde daje?
 f. Kome ko gde šta daje?
 etc.

Many more permutations of the *wh*-phrases are possible in (176). Their ordering affects the realization of the multiple foci in the answer, and hence has a pragmatic function, but syntactically their position is not constrained.

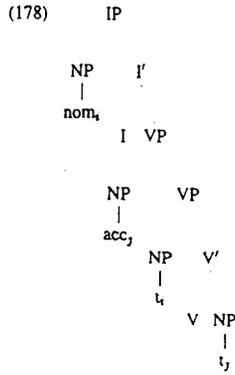
4.3.4 Serbo-Croatian Clause Structure

On the basis of the discussion of the previous sections we can arrive at the structural representation of a Serbo-Croatian clause. We have some evidence that there is a VP and if we adopt some of the standard syntactic assumptions about the relationship between structure and binding facts then we can also assume a configurational structure within the VP. We have seen that in order to derive VS word orders, the simplest assumption is to adopt the subject-internal VP hypothesis. Hence, I propose that some of the constituent orderings can be represented as the following S-structures. Only SVO is base-generated. Other orderings are derived by movement. We will see in chapter 5 that based on the focus projection facts these same orderings may need to have different structures.

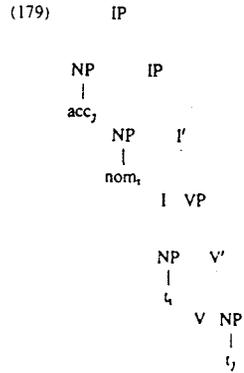
SVO



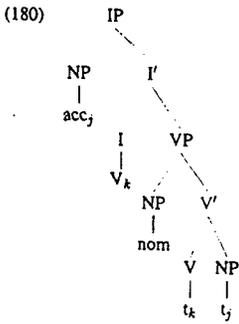
SOV



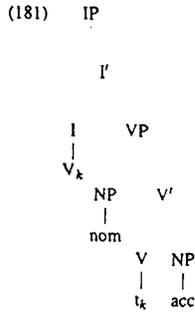
OSV



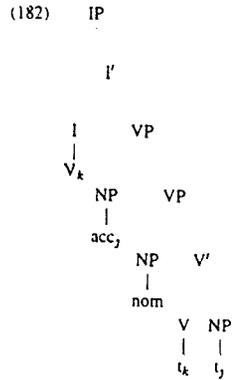
OVS



VSO



VOS



The representations in (177)–(182) involve a minimal set of assumptions: VP subject-internal hypothesis, adjunction to a maximal projection, specifier substitution, and V-movement to I. Crucially, these representations do not assume Case-driven movement, rather the movement is discourse driven, as we will see in chapter 5.

4.4 Summary

In this chapter I have argued for a configurational structure of Serbo-Croatian at the level of the clause, based on (i) syntactic evidence for VP and (ii) subject/object asymmetries. Based on adverb placement, there was some evidence for a configurational structure of the VP. However, the data are compatible with a hierarchical structure if adverb placement is restricted to a maximal projection, rather than a V' .

The relative freedom of constituent ordering has been presented as a difference between a canonical structure and non-canonical structures derived by movement operations.²⁰ There seems to be little evidence for differentiation of the movement operations involved in deriving non-canonical structures, although their result may have different consequences relative to different properties relevant for interpretation. For example, interpretation of idioms may be sensitive to the proximity of the predicate and its argument, hence long-distance movement of the argument will break the idiomatic connection. This is also true for anaphor binding. However, parasitic gaps do not seem to be sensitive to the distance of the filler. Hence, sensitivity to distance seems to be the property of the

²⁰The movement metaphor is intended as a research tool and not as a claim about the psychological reality of syntactic representation. The generalizations gathered under this conceptualization of the grammar should be useful for any modeling of syntactic structure.

testing construction, rather than a property of the constituent permutation operation. These interpretative properties of different types of movement are often tied to the A vs. A' distinction between the syntactic positions. Using the A vs. A' criterion, we have seen that one and the same position can have both properties, depending on the test applied. This result is familiar from other scrambling languages, such as German, Hindi, Japanese, etc. (see Webelhuth, 1989; Mahajan, 1990; Miyagawa, 1997, respectively).

Traditional labels, such as scrambling and topicalization, may be convenient as a short-cut description of the distance accrued between the expression and its thematic relation site; scrambling being involved in short distance (clause internal) and topicalization as long distance (clause external) relations. However, as far as Serbo-Croatian is concerned, these terms do not seem to describe different syntactic operations. There are different consequences, both syntactic, semantic and pragmatic, correlating with different "length" of displacement, but they do not seem to provide evidence for different types of syntactic operations involved in constituent permutation.

This investigation of the syntactic properties of Serbo-Croatian serves the purpose of providing some background for the investigation of the positional focus and its consequences for focus projection. The two main results of this chapter that will be relevant for the investigation of focus projection is the evidence that there is a syntactic reflex of the subject/predicate distinction, and that VP adjoined position functions as an A position according to all of the tests. The evidence for VP will allow us to assume that in addition to NP scrambling, a VP can be scrambled as well. The indication that VP adjoined position counts as an A position will be used as a supporting argument for suggesting that

V-internal arguments can be treated as base-generated in either order. This treatment of object scrambling is similar to the analysis of object scrambling in Dutch given in Neeleman and Reinhart (1998).

CHAPTER 5

FOCUS AND FOCUS PROJECTION IN SERBO-CROATIAN

5.1 Introduction

In this chapter I present the focus projection facts in Serbo-Croatian under two types of prosodic patterns: neutral and non-neutral (or emotive). Given that there are two types of constituent orderings, as we saw in Chapter 4, canonical and scrambled, there are four types of conditions to be examined, shown in Table 5.1. The main empirical issue addressed in this chapter is the presence versus absence of focus projection in different word orders under different intonation patterns. I show that the ability of focus to project depends both on word order and on the type of intonation used.

Intonation	Word Order	
	canonical	scrambled
neutral intonation	A: full projection	B: limited projection
emotive intonation	C: limited projection	D: limited projection

Table 5.1: Possible combinations of word order type and intonation type.

I will show that full focus projection, focus projection up to the sentence (propositional) level (i.e. the extended focus projection in the sense of Gussenhoven (1999)) is possible only in condition A. In all other conditions, i.e. B, C, and D, only a limited (i.e. the restricted focus projection in the sense of Gussenhoven (1999)) focus projection is possible. That is, in all other conditions, the broadest constituent that can be focused is a constituent denoting a predicate.

The main theoretical question addressed in this chapter is: What kind of theory of focus projection and what kind of theory of syntactic structure (involving scrambling) predicts these facts about focus projection? As far as the theory of focus projection is concerned, I will argue that a theory of focus projection sensitive to argument structure, such as that of Selkirk (1984, 1995) and Rochemont (1986, 1998), is needed, since generally neither adjuncts nor transitive or unergative subjects are able to project focus onto the verb.

As far as the theory of focus projection is concerned, in my proposal I assume that the focus domain is a syntactic constituent and I take the Selkirk/Rochemont Focus Projection Algorithm (SFPA), presented in Chapter 2, as a starting point. I show that unmodified, the SFPA has shortcomings in accounting for the data in Serbo-Croatian. I will argue for the following modifications: (i) limiting focus projection up to the VP node, (ii) removing the sensitivity to traces for the purpose of focus projection, (iii) allowing subjects and indirect objects to be F-marked if the verb is, (iv) postulating a distinction between inherited F-markers and F-markers directly acquired through prosodic prominence, (v) allowing the verb to project F-marking only if it has inherited the F-marking, and (vi) allowing sensitivity to semantic type of the verbs and their complements.

As far as the syntactic structures of different word orders are concerned, the structures of scrambled sentences need to encode two properties: (i) the right constituents for focus interpretation and (ii) the right constituent arrangement for encoding adjacency between the constituent containing the focus exponent and the verb. I will show that, under the standard set of syntactic assumptions where scrambling is leftward adjunction to XP, the structures needed for the interpretation of focus and the adjacency requirement in scrambled sentences under emotive intonation patterns are unavailable. If we relax the syntactic assumptions regarding scrambling and obtain the correct structures for the purpose of interpreting focus, the structures needed for the interpretation of focus are incompatible with the structures needed for the interpretation of quantifier scope and quantificational binding. I show that even though the adjacency constraint on focus projection from a scrambled internal argument onto the verb can be encoded as a specifier-head agreement within a functional projection FocusP analysis, on such an account there are still interpretive problems for the focus domain. The price of adopting the functional projection FocusP is that the focus domain under this analysis is not a syntactic constituent. This consequence of the spec-head agreement analysis significantly complicates the semantic interpretation of focus and in the end makes it undesirable.

Although some important issues will remain undecided, the picture that emerges is that of a theory of focus in which word order and intonation have significant but complementary roles to play. If our guiding assumption in the semantic interpretation of focus is that focus is a syntactic constituent, as many theories of focus interpretation suppose (Rooth, 1992; Roberts, 1996; Kadmon, 2000) then our assumptions about syntactic structures in

scrambling languages must take focus domains into account when arguing for a syntactic representation of non-canonical word orders.

The chapter is organized as follows. Section 2 defines the prosodic patterns to be considered. Section 3 discusses constraints on focus projection in Serbo-Croatian: (i) word order and predicate valency, (ii) argumenthood, and (iii) the semantic type of the constituent containing the focus exponent. These constraints are based on the potential focus domains in different prosodic conditions of six types of syntactic environments: mono-transitive, ditransitive, and four types of intransitive sentences involving: unergative, unaccusative, stage-level, and individual-level predicates. Section 4 discusses the ramifications of the constraints on focus projection in Serbo-Croatian for the English-based SFPA and proposes necessary modifications in accordance with the syntax of scrambling.

5.2 Preliminaries: Neutral vs. Emotive Prosodic Patterns

5.2.1 Neutral Prosody

By a neutral prosodic pattern in a declarative utterance I mean the default late phrase accent placement, that is, an utterance in which the phrase accent occurs on the rightmost (final) content word in the sentence, as discussed in Chapter 3. We will only consider the L-phrase accent in this study. The pragmatic functions and the focus projection properties of other phrase accents discussed in Chapter 3 are beyond the scope of this dissertation. There are several reasons why we will only deal with the L-phrase accent. First, the L-accent occurs in assertions, such as declarative statements, for which we have a semantic and pragmatic analysis of analogous counterparts in English and other languages; second,

other phrase accent types are used in contexts such as questions, continuations, vocative chants, uncertainty, etc. which require additional pragmatic analysis; third, it is not entirely clear that other phrase accents allow focus ambiguity beyond the minimal XP containing the focus exponent. Thus the L- phrase accent is an ideal candidate as a starting point in exploring focus projection in Serbo-Croatian.

In keeping with the discussion in Chapter 3 I will assume that from the phonological point of view, the focus exponent could be identified not with the word containing the pitch accent, as in English, but rather with the word realizing the L- phrase accent,¹ since pitch accents in Serbo-Croatian are lexical rather than post-lexical as in English. The L- phrase accent occurs on the right-most phonological word in the intonational phrase, which is the right-most constituent within the sentence.

5.2.2 Non-neutral (Emotive) Prosodic Patterns

By a non-neutral prosodic pattern I mean non-final phrase-accent placement. That is, a L- phrase accent placement that does not coincide with the rightmost (final) constituent. To show the difference between the neutral and the emotive intonation patterns, I here repeat two figures from Chapter 3. The neutral intonation pattern, where the phrase accent placement is rightmost, is illustrated in Figure 5.1. The same sentence under the emotive intonation pattern with the phrase accent on the penultimate phonological word is illustrated in Figure 5.2.

¹Even though the focus exponent is identified with the word containing a pitch accent in English, it is possible to view the focus exponent in even English as tied to the phrase accent, because the nuclear pitch accent is the pitch accent that immediately precedes the phrase accent. In other words, in both languages, the focus exponent is related to the phrase accent.

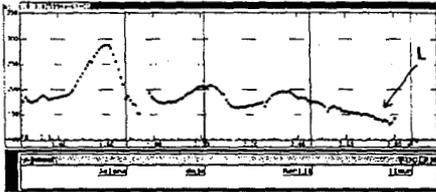


Figure 5.1: *Jelena daje Mariji limun* 'Jelena is giving Mary a lemon.'

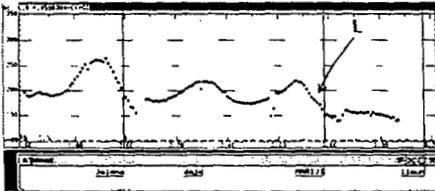


Figure 5.2: *Jelena daje MARIJI limun* 'Jelena is giving MARY a lemon.'

I will adopt a convention of marking these prosodic patterns in the following way: the neutral intonation pattern will be unmarked, whereas the non-neutral intonation pattern will be indicated by capitalization of the prominent word in the text, and by underlining the constituent in the symbolic linear representation of the ordering. That is, SVO will stand for a neutral intonation rendering of a monotransitive sentence, whereas SVO will stand

for a non-neutral rendering of the same type of a sentence, where the prominence is on the subject.

5.3 Constraints on Focus Projection in Serbo-Croatian

5.3.1 Word Order and Internal vs. External Argument Distinction

This section will establish the following descriptive generalizations concerning focus projection: (i) focus projection up to the sentence level is possible only in canonical orderings of nominal arguments under neutral intonation, (ii) subjects and verbs do not project focus, (iii) a scrambled internal argument can project focus onto its selecting head only if the argument and its head are adjacent.

"The Focus domain" is that portion of an utterance which corresponds to a direct answer to a *wh*-question. As we have seen in chapter 2, the size of the focus domain can vary from a subpart of a sentence (narrow focus) to the whole sentence (broadest focus).

5.3.1.1 Monotransitive Predicates

We start with a monotransitive sentence. That is, a S(subject)V(erb)O(bject) structure. In order to examine possible focus domains of a monotransitive sentence, we will consider all of the logically possible constituent orderings of this sentence type. Given that this type of sentence has three major constituents (auxiliaries are excluded because they are clitics and can occur only in the "second position"), the number of possible orderings is six. We will see that canonical ordering of the NP arguments in a monotransitive sentence is a necessary condition for a sentence-broad focus and focus ambiguity. The verb can occupy either the

initial or the medial position, but it cannot occur in the final position. We first consider different constituent orderings under neutral prosody.

In Serbo-Croatian, when conveying an all-new Sentence-focus, neutral prosody requires a canonical ordering of NP arguments with the verb either preceding or immediately following the subject. Any other order does not produce an all-new broad focus utterance. This is shown in (183).

(183) a. What's new?

b. Jelena je kupila kompjuter. SVO
Jelena.NOM AUX bought computer.ACC
'Jelena bought a computer.'

c. #Jelena je kompjuter kupila. SOV
Jelena.NOM AUX computer.ACC bought
'Jelena bought a computer.'

d. #Kompjuter je kupila Jelena. OVS
computer.ACC AUX bought Jelena.NOM
'Jelena bought a computer.'
'A computer was bought by Jelena.'

e. #Kompjuter je Jelena kupila. OSV
computer.ACC AUX Jelena.NOM bought
'Jelena bought a computer.'

f. #Kupila je kompjuter Jelena. VOS

bought AUX computer.ACC Jelena.NOM

'Jelena bought a computer.'

g. Kupila je Jelena kompjuter. VSO

bought AUX Jelena.NOM computer.ACC

'Jelena bought a computer.'

As we see from the acceptability of different word orders in (183), only two of the six possible constituent orderings under neutral intonation can be accepted in the so-called out-of-the-blue contexts, often assumed to be elicited by the question such as "What's new?" The unacceptable versions of (183), marked "#", are inappropriate in the given context because they all are interpreted as having foci narrower than the sentence. All of them allow the possibility of narrow focus on the final constituent, which bears the sentence accent (the L- phrase accent). We will consider contexts in which these orders are acceptable below.

In addition to effectively communicating sentence broad focus interpretation, (183b) is also ambiguous. It can be an answer to two other (implicit) questions shown in (184). Explicit questions ordinarily would involve additional means of attention signaling in discourse such as pronominalization. The content word used in an explicit question would not be repeated in the answer but would be most commonly pronominalized either as a clitic pronoun or a full non-prominent pronoun. That is, a speaker would tend to use an inherently non-prominence-bearing element – a fairly common strategy of withdrawing attention and signalling coreference. However, for the purpose of illustrating question/answer congruence in this dissertation, I will use non-pronominalized versions of sentences that serve as answers.

- (184) a. What did Jelena do?
 b. What did Jelena buy?
 c. Jelena je kupila kompjuter. SVO=(183b)
 Jelena.NOM aux bought computer.ACC
 'Jelena bought a computer.'
 d. Kupila je kompjuter. VO
 bought AUX computer.ACC
 '(She) bought a computer.'

So, the additional questions in (184) show that (184c) is congruent with a question eliciting Sentence-focus, VP-focus, or O-focus (direct object focus); (184d), a *pro*-drop version of (183b), is compatible a question eliciting VP-focus or O-focus. This shows that SVO ordering under neutral intonation is three-way ambiguous with respect to focus, just like its English counterpart with the nuclear accent on the direct object.

We now proceed to consider the sentences that were marked as inappropriate in the context that required Sentence-focus. We'll look at each sentence in turn, determining their focus structure by considering implicit questions which they are congruent with. Consider the verb-final orderings, i.e., the SOV and the OSV counterparts of (183b). Note that both questions (a) and (b) in (185) elicit narrow focus on the verb.

- (185) a. What did Jelena do with the computer?
 b. Did Jelena RENT a computer?

c. (Ne.) Jelena je kompjuter kupila. SOV=(183c)

(no,) Jelena.NOM AUX computer.ACC bought

'(No,) Jelena bought the computer.'

d. Kompjuter je Jelena kupila. OSV=(183e)

computer.ACC AUX Jelena.NOM bought

'Jelena bought a computer.'

Both of these sentences are congruent with the question eliciting narrow focus on the verb. Neither of them allows a VP focus interpretation, as shown in (186). What the sentences have in common is that they are both verb-final.

(186) a. What did Jelena do?

b. #Jelena je kompjuter kupila. SOV=(183c)

Jelena.NOM AUX computer.ACC bought

'Jelena bought the computer.'

c. #Kompjuter je Jelena kupila. OSV=(183e)

computer.ACC AUX Jelena.NOM bought

'Jelena bought a computer.'

The inappropriateness of (186b) and (186c) in answering a question which is eliciting a VP focus shows that with neutral intonation V-final structures do not allow VP focus. Thus, under neutral intonation, verb-final monotransitive structures are compatible only with an interpretation of narrow focus on the verb. In other words, the *F*-marking on the *V* due to prosodic prominence of final position cannot project focus above the *V*.

The next two structures to examine are OVS, and VOS, presented in (187). Both of these are able to function as answers to the (implicit) question eliciting narrow focus on the subject, as shown in (187); and neither of them can function as an answer to a question eliciting VP focus or Sentence focus, as indicated by “#” in (188).

(187) a. Who bought the computer?

b. Kompjuter je kupila Jelena. OVS=(183bd)
 computer.ACC AUX bought Jelena.NOM
 ‘Jelena (L–) bought the computer.’

c. Kupila je kompjuter Jelena. VOS=(183bf)
 bought AUX computer.ACC Jelena.NOM
 ‘Jelena (L–) bought a computer.’

(188) a. What did Jelena do?

b. What did Jelena do with the computer?

c. #Kompjuter je kupila Jelena. OVS=(183bd)
 computer.ACC AUX bought Jelena.NOM
 ‘Jelena (L–) bought the computer.’

d. #Kupila je kompjuter Jelena. VOS=(183bf)
 bought AUX computer.ACC Jelena.NOM
 ‘Jelena (L–) bought a computer.’

The sentences in (188) show that S-final structures cannot be used as answers expecting VP or V focus. This means that prominent subjects are not able to project focus onto the verb.

There are two more examples left to consider, shown in (189). Both involve putting the direct object in final position. One of them is the canonical constituent ordering, i.e. SVO, which we have already considered, and the other is the VSO structure.

(189) a. What happened?

b. What did Jelena buy?

c. What did Jelena do?

d. Jelena je kupila kompjuter. SVO=(183b)

Jelena.NOM AUX bought computer.ACC

'Jelena bought the computer.'

e. What happened?

f. What did Jelena buy?

g. What did Jelena do?

h. Who bought what?

i. Kupila je Jelena kompjuter. VSO=(183g)

bought AUX Jelena.NOM computer.ACC

'Jelena bought a computer.'

The fact that VSO structures are also ambiguous with respect to focus is interesting because it shows two things about focus and word order. First, it shows that it is the ordering

of nominal arguments with respect to each other that is relevant for focus projection. Second, it shows that as long as the verb is not in a prominent position, i.e., the final position, its placement is irrelevant for focus projection.²

In addition to allowing the same set of focus domains as SVO order, VSO ordering also allows the so-called double-focus interpretation, that is, the interpretation in which the subject and the direct object (but nothing else) are focused. These types of focus structures are elicited with multiple *wh*-questions, as in English example (190).

- (190) a. Who kissed who?
b. _F[SUE] kissed _F[LESLIE].

I note this possibility here because we will see that a similar option also exists in ditransitive structures for subjects and indirect objects. However, I will not attempt to account for with these case in this thesis. These double-focus possibilities occur only in neutral intonation patterns but never in the emotive intonation patterns we are considering here. They also differ from those cases in which double focus is marked with H- phrase accent and %H boundary tone, as discussed in Chapter 3. Under our view of focus projection, multiple foci with a single focus exponent are not permitted (see the discussion on page 32). The possibility that such configurations exist needs to be checked for prosodic ambiguity in a controlled experiment, but I will ignore them for the purpose of this study.

²It seems worth mentioning that according to Holloway-King (1995), Russian also allows broad focus in VSO structures. She also claims that in terms of the syntactic criteria, VSO is also the default structure for Russian. According to Holloway-King, SVO orders involve topicalized subjects, which are the most common utterances due to properties of most discourse types and not due to grammar. In her theory VSO is the default order generated by the grammar. She assumes the VP-internal subject hypothesis for Russian, and obligatory V-movement to Infl, which produces VSO. Unless discourse requirements force the presence of a topic, the grammar does not induce SVO ordering.

A summary of the discussed facts about possible focus domains of different constituent orderings in monotransitive sentences under neutral intonation is given in Table 5.2 below.

S-Final	O-Final	V-Final
OVS	SVO	SOV
S	SVO, VO, O	V
VOS	VSO	OSV
S, < O,S >	VSO, VO, O, <S,O>	V

Table 5.2: Constituent ordering possibilities of monotransitive predicates and their focus properties under neutral intonation pattern. The bold face indicates focus possibilities, whereas the regular caps represent constituent ordering. Angle brackets stand for multiple focus. (S=subject, O=direct object, V=verb.) Only SVO and VSO orders (central column) allow focus projection.

We will now look at the possibilities that arise for different constituent orderings in non-neutral intonation patterns for intransitive sentences. We will see that the size of the possible focus domains in these condition is always narrower than the sentence. That is, just as scrambling affects the size of the possible focus domain in neutral intonation, non-neutral intonation also affects the size of the focus domain. In both cases, the focus domain is narrower than in neutral conditions for both constituent ordering and intonation.

Considering non-neutral intonational patterns involves looking at all the possible constituent orderings and varying the prosodic prominence from constituent to constituent in

each. Since monotransitive predicates have 6 possibilities of constituent orderings, that means considering 12 further cases besides the six already discussed.

(191) a. Who bought a computer?

b. Did MARIJA buy a computer?

c. Was it Marija who bought a computer?

d. JELENA je kupila kompjuter. SVO

Jelena.NOM AUX bought computer.ACC

'Jelena bought a computer.'

e. Was Jelena given a computer?

f. What did Jelena do with a computer?

g. Jelena je KUPILA kompjuter. SVO

Jelena.NOM AUX bought computer.ACC

'Jelena bought a computer.'

(192) a. Who bought a computer?

b. Did Marija buy a computer?

c. JELENA je kompjuter kupila. SOV

Jelena.NOM AUX computer.ACC bought

'Jelena bought a computer.'

d. Did Jelena buy a new car?

e. What did Jelena buy?

f. What did Jelena do?

g. Jelena je KOMPJUTER kupila. SQV

Jelena.NOM AUX computer.ACC bought

'Jelena bought a computer.'

(193) a. Did Jelena buy a new car?

b. What did Jelena buy?

c. What did Jelena do?

d. KOMPJUTER je kupila Jelena. QVS

computer.ACC AUX bought Jelena.NOM

'Jelena bought a computer.'

'A computer was bought by Jelena.'

e. Was a computer GIVEN to Jelena?

f. What did Jelena do with the computer?

g. Kompjuter je KUPILA Jelena. OVS

computer.ACC AUX bought Jelena.NOM

'Jelena bought a computer.'

'A computer was bought by Jelena.'

(194) a. What did Jelena buy?

b. Did Jelena buy a new car?

c. KOMPJUTER je Jelena kupila. QSV
computer.ACC AUX Jelena.NOM bought
'Jelena bought a computer.'

d. Who bought a new computer?

e. Did Marija buy a new computer?

f. Kompjuter je JELENA kupila. QSV
computer.ACC AUX Jelena.NOM bought
'Jelena bought a computer.'

(195) a. Was computer finally BOUGHT by Jelena?

b. What was done with a computer by Jelena?

c. KUPILA je kompjuter Jelena. VOS
bought AUX computer.ACC Jelena.NOM
'Jelena bought a computer.'

d. What did Jelena buy?

e. Did Jelena buy a new car?

f. What did Jelena do?

g. Kupila je KOMPJUTER Jelena. VQS
bought AUX computer.ACC Jelena.NOM
'Jelena bought a computer.'

- (196) a. Did Jelena BUY a computer?
- b. What did Jelena do with a computer?
- c. KUPILA je Jelena kompjuter. VSO
 bought AUX Jelena.NOM computer.ACC
 'Jelena bought a computer.'
- d. Who bought a computer?
- e. Did MARIJA buy a computer?
- f. Was it Marija who bought a computer?
- g. Kupila je JELENA kompjuter. VSO
 bought AUX Jelena.NOM computer.ACC
 'Jelena bought a computer.'

These examples provide too much information to be grasped at once. In order to facilitate a discussion of the relevance of these examples I present the information provided by these examples in table 5.3.

Table 5.3 shows two things: (i) under neutral intonation different word orders produce different focus domains (row 1), and (ii) the same word order under different intonation patterns gives different focus structures (different columns). The second property is what we would expect, given what we know about languages like English. The table thus shows that Serbo-Croatian is a language in which focus can be conveyed either prosodically, as in English, or by position, as in Catalan, Hungarian, Turkish, Hindi, among others. In other words, Serbo-Croatian is a language with both in-situ focus and ex-situ focus (in the

Position - Prosody Interaction						
Neutral copied from Table 5.2	SVO	SOV	OSV	OVS	VSO	VOS
	SVO, VO, O	V	V	S	VSO, VO, O, <S,O>	S <O,S>
Emotive	<u>S</u> VO	<u>S</u> OV	<u>O</u> SV	<u>O</u> VS	<u>V</u> SO	<u>V</u> OS
	V	VO, O	S	V	S	VO, O
Emotive	S <u>V</u> O	S <u>O</u> V	Q <u>S</u> V	Q <u>V</u> S	<u>V</u> SO	<u>V</u> OS
	S	S	O	VO, O	V	V

Table 5.3: Summary of possible focus domains in different word order conditions under neutral prosody (row 1) and non-neutral prosody (rows 2 and 3). Non-neutral prosody is indicated by an underlining of the element that bears prominence.

terminology of Horvath (1995)). It is also important to notice that neither verb-prominence nor subject-prominence allows focus projection.

5.3.1.2 Ditransitive Predicates

In this section I show that for ditransitive predicates, scrambling of the direct object from its canonical position results in narrow focus of the indirect object, just like in Spanish

as shown by Zubizarreta (1998). In a neutral intonation pattern, for VP as a whole to be focused the canonical ordering of the two internal arguments is necessary: for sentence-broad focus, the canonical ordering of all of the nominal arguments is necessary. The position of the verb, however, is unconstrained, as long as it does not occur in final position. These facts are thus very similar to the facts we have seen regarding the monotransitive predicates.

As an illustration of word order effects in ditransitive sentences, consider the following example involving a typical ditransitive predicate *dati* 'give as a present'.

(197) a. What's new?

canonical

b. Marija je poklonila Jeleni novi kompjuter. SVIO
 Mary.NOM aux gave Jelena.DAT new.ACC computer.ACC
 'Mary gave a new computer to Jelena.'

(198) scrambling within the VP

a. #Marija je poklonila novi kompjuter Jeleni. SVOI
 Mary.NOM aux gave new.ACC computer.ACC Jelena.DAT
 'Mary gave a new computer to Jelena.'

b. #Marija je novi kompjuter poklonila Jeleni. SOVI
 Mary.NOM aux new.ACC computer.ACC gave Jelena.DAT
 'Mary gave a new computer to Jelena.'

- c. Marija je Jelena poklonila novi kompjuter. SIVO
 Mary.NOM aux Jelena.DAT gave new.ACC computer.ACC
 'Mary gave a new computer to Jelena.'
- d. #Marija je novi kompjuter Jelena poklonila. SOIV
 Mary.NOM aux new.ACC computer.ACC Jelena.DAT gave
 'Mary gave a new computer to Jelena.'
- e. #Marija je Jelena novi kompjuter poklonila. SIOV
 Mary.NOM aux Jelena.DAT new.ACC computer.ACC gave
 'Mary gave a new computer to Jelena.'

By scrambling within VP, I mean any of the possible permutations of the two objects around the verb: both ordering of arguments after the verb and before the verb, and either combination of pre-verbal position for one and post-verbal for the other. The result seems to be that any deviation from the canonical final position for the direct object within the core VP (i.e., the structure below the subject) blocks sentence-broad focus. However, the indirect object seems free to move to the left of the verb.³ The same is true of "sentence scrambling" as the inappropriateness of the following sets of examples attests. (By sentence scrambling I mean orders that put something other than the subject in initial position, i.e. movement over the subject.)

³This characterization of the word order is taking the verb as the pivot. The same word order can also be described from the nominal arguments' point of view, and treated as verb movement over the indirect object.

(199) scrambling within the IP

- | | |
|--|------|
| a. #Jeleni je Marija poklonila novi kompjuter. | ISVO |
| b. #Jeleni je Marija novi kompjuter poklonila. | ISOV |
| c. #Jeleni je novi kompjuter poklonila Marija. | IOVS |
| d. #Jeleni je novi kompjuter Marija poklonila. | IOSV |
| e. #Jeleni je poklonila novi kompjuter Marija. | IVOS |
| f. #Jeleni je poklonila Marija novi kompjuter. | IVSO |
| g. #Novi kompjuter je Marija poklonila Jeleni. | OSVI |
| h. #Novi kompjuter je Marija Jeleni poklonila. | OSIV |
| i. #Novi kompjuter je Jeleni Marija poklonila. | OISV |
| j. #Novi kompjuter je Jeleni poklonila Marija. | OIVS |
| k. #Novi kompjuter je poklonila Jeleni Marija. | OVIS |
| l. #Novi kompjuter je poklonila Marija Jeleni. | OVSI |
| m. Poklonila je Marija Jeleni novi kompjuter. | VSIO |
| n. #Poklonila je Marija novi kompjuter Jeleni. | VSOI |
| o. #Poklonila je Jeleni novi kompjuter Marija. | VIOS |
| p. #Poklonila je Jeleni Marija novi kompjuter. | VISO |

- | | |
|--|------|
| q. #Poklonila je novi kompjuter Jeleni Marija. | VOIS |
| r. #Poklonila je novi kompjuter Marija Jeleni. | VOSI |

Just to remind the reader, all the considered cases in (199) assume neutral prosody. Cases in which sentence stress falls on some of the non-final constituents in the sentence will be considered in section 5.4.2.2.

A brief summary of the data: In the case of sentences with a ditransitive predicate under neutral intonation pattern, sentence focus is possible only with the canonical positioning of the subject first and of the direct object last under neutral intonation. The indirect object may occur immediately to the right or to the left of the verb. This suggests that a necessary condition for broad focus is canonical ordering of nominal arguments with respect to each other.

Since there are 24 possible constituent orderings in a ditransitive sentence, I will not go over all the possibilities of orderings and their focus domains. The remaining data can be found in Appendix 1. Instead I present a table that summarizes the correlation between constituent orderings and focus domains under neutral intonation. Given that under neutral intonation, the prominence falls on the final element, the constituent containing the focus exponent in these structures can be identified with the last element. Therefore, the summary of the focus possibilities under all the different constituent orderings is sorted according to the final element in the clause and presented in Table 5.4.

Table 5.4 provides us with several obvious generalizations: (i) in neutral intonation the final element can always function as (narrow) focus; (ii) focus projection is possible only

when the prominence bearing element is contained within one of the internal arguments of the verb.

Table 5.4: Constituent ordering possibilities of ditransitive predicates and their focus properties under neutral intonation pattern. The bold face indicates focus possibilities, whereas the regular caps represent constituent ordering. Angled brackets stand for multiple focus. (S=subject, O=direct object, I=indirect object, V=verb.)

S-Final	O-Final	I-Final	V-Final
OVS	SVO	SOI	SIOV
S	SVIO, VIO, O	I	V
OVIS	SIVO	SOVI	SOIV
<IS>, S	SIVO, IVO, VO, O	VI, I	V
IOVS	IVSO	OVIS	ISOV
S	<S,O>, O	VS ^I , I, <S,I>	V
SOVS	ISVO	OSVI	IOSV
S	O	SV ^I , VI, I	V
VIOS	VISO	VOSI	VOIV
S	O	I, <S,I>	V
VOIS	VISO	VSIO	VSIOV
<IS>, S	VSIO, VIO, VO, O	I	V

It follows from (ii) that neither subject⁴ nor verb can project beyond the minimal constituent containing them. That is, they cannot facilitate the projection onto the verb phrase. We have found the same pattern in monotransitive sentences as well, as table 5.2 attests.

The minimal number of constituents (ignoring the *pro*-drop option) in a sentence with a ditransitive predicate is 4. The number of possible different word orders is 24. When we considered neutral prosody, we looked at all 24 possible orderings. If we want to consider non-neutral prosody then we are dealing with 96 possibilities. In other words, as the number of constituents in a sentence increases, the number of possible combinations of constituent ordering and intonation patterns increases exponentially.⁵ However, for the purpose of exploring focus projection we can eliminate some of the possibilities right away. If our generalization about the focus exponence of the subject and the verb based on the neutral intonation pattern in scrambled ditransitive sentences and the prosody-position correlation established for monotransitive sentences is correct, and as far as I can see that seems to be empirically correct, then we can eliminate cases in which the subject or the verb bears prominence. This reduces the number of cases to be considered to 48. We can further reduce the number of relevant cases to 36 by eliminating orderings in which prosodic prominence in non-neutral patterns falls on the final constituent. This is because

⁴The table shows two exceptions to this claim. The possibility of focus projection in OVIS and VOIS orderings, shown in Table 5.4 must be further considered for possible prosodic ambiguity. If there is a prosodic ambiguity then the generalization can be maintained; if there is none, then we have to consider other alternatives in accounting for these cases. As I said before, for the purpose of this thesis I will ignore these examples.

⁵Actually, as the number of constituents in a sentence increases the number of possibilities increases hyper-exponentially. The formula for deriving the number of constituent orderings is $n!$; the formula for deriving the number of possibilities that include non-canonical word orders under non-neutral prosody is: $n(n!) - 1$.

in these cases, only narrow focus on the prominence bearing element is possible. Focus projection does not occur in these cases possibly because of its paradigmatic contrast with neutral intonation patterns where the extra prominence in the final position is interpreted as emphatic. This is also true of English. For example if a sentence *John bought a COMPUTER* is uttered with stronger stress (L+H* accent, expanded pitch range, etc.) on the word "computer", the sentence is more likely to be interpreted as narrow focus on the direct object than as either VP-focus or Sentence-focus.

The generalizations about the focus domain possibilities of ditransitive predicates in non-neutral intonation patterns are presented in two tables. Table 5.5 presents the focus domain possibilities in cases where the direct object is prosodically prominent, and Table 5.6 presents the same type of facts for the indirect object.

One of the generalizations that emerges from the two tables above is that an internal argument can project focus onto the verb if the verb is adjacent to the argument. I will call this the Adjacency Constraint on Focus Projection.

(200) Adjacency Constraint on Focus Projection

In emotive intonation patterns, an internal argument of the verb can project focus onto the verb only if the verb is adjacent to the argument.

One of the questions that we need to answer is whether the syntactic structures of scrambled sentences can effectively encode the adjacency effect of the focus projection facts. We will consider the necessary syntactic assumptions and their consequences for achieving this result in section 5.4. We now move to intransitive predicates.

Focus Domains of a Ditransitive Clause with O-prominence			
S-Initial	I-Initial	O-Initial	V-Initial
SVQI VO, O	ISQV OV, O	QSVI O	VSQI O
SIOV OV, O	IQSV O	QSIV O	VIQS VIO, VO, O
SQIV O	IQVS OV, O	QISV O	VQSI VO, O
SQVI OV, O	IVQS VO, O	QIVS O	VQIS VO, O
		QVSI OV, O	
		QVIS OV, O	

Table 5.5: Constituent ordering possibilities of ditransitive predicates and their focus properties under emotive intonation pattern with prominence on O. The bold face indicates focus possibilities, whereas the regular caps represent constituent ordering. (S=subject, O=direct object, I=indirect object, V=verb.)

5.3.1.3 Intransitive Predicates

Unaccusatives vs. Unergatives The discussion of focus projection in sentences with intransitive predicates in English has a long history. Variable placement of prominence

Focus Domains of a Ditransitive Clause with I-prominence			
S-Initial	I-Initial	O-Initial	V-Initial
SVIO VI, I	I SVO	OSIV IV, I	VSIO I
SIVO IV, I	I SOV	OISV I	VIOS VI, I
SIOV I	I OSV	OIVS IV, I	VISO VI, I
SOIV IV, I	I OVS	OVIS VI, I	VOIS I
	I VSO IV, I		
	I VOS IV, I		

Table 5.6: Constituent ordering possibilities of ditransitive predicates and their focus properties under emotive intonation pattern with prominence on I. The bold face indicates focus possibilities, whereas the regular caps represent constituent ordering. (S=subject, O=direct object, I=indirect object, V=verb.)

(the subject vs. the predicate) in these types of sentences under broad focus interpretation has served as an argument that prominence and broad focus are not related through the

grammar, but are rather governed by the (human) need to highlight pragmatically relevant elements, which are obviously contextually determined (Bolinger, 1972, 1982).

(201) a. What happened?

b. JOHNSON died. unaccusative predicate

c. #JOHNSON laughed. unergative predicate

As discussed in Chapter 2, Selkirk (1995) argues that differing properties of accent placement in intransitive sentences follows from the syntactic encoding of argument structure. Thus, a broad focus interpretation of a sentence containing an unaccusative predicate is predicted to be possible with nuclear accent placement on the subject, because the subject is the internal argument of the verb. Sentences containing a predicate from the unergative class of intransitive predicates, those whose subjects are not internal arguments of the verb, are predicted not to have broad focus interpretation with nuclear accent on the subject.

To test these claims for Serbo-Croatian, we look at a number of intransitive predicates and vary the order of the subject and the predicate. Since in neutral intonation patterns the prominence is on the final constituent, in intransitive sentences, the canonical order, SV, will have the prominence on the verb, whereas the non-canonical ordering, VS will make the subject prominent. If the unaccusative/unergative distinction among intransitive predicates plays the same role as it is claimed for English by Selkirk (1995) and others, we predict that unaccusative predicates will favor the non-canonical order, whereas the unergative predicates would allow broad focus only under the canonical ordering: <subject,

predicate>. This is in general what we find (see also Bibović, 1971).⁶ Thus, placement of pitch accent in English corresponds to word order in Serbo-Croatian.

Note: the following examples assume a neutral intonation pattern.

(202) a. What's new?

unaccusatives

b. #Suba umro.

Suba.NOM died.

'Suba died.'

c. Umro Suba.

died Suba.NOM

'Suba died.'

d. #Sunce sija.

sun.NOM shining

'The sun is shining.'

e. Sija sunce.

shining sun.NOM

'The sun is shining.'

⁶Here is a naturally occurring example found at <http://www.RADIO021.co.yu/vesti.hum> on March 8, 2000.

- (i) Za protekla 24 sata na teritoriji gradske
for past 24 hours on territory city.POSS
zajednice dogodilo se pet nezgoda.
community happened REFLX five accidents
'Within our municipality, in the past 24 hours there were five accidents.'

(203) more unaccusatives

a. #Kiša pada.

rain falling

'It's raining.'

b. Pada kiša.

falling rain

'It's raining.'

c. #Nebo se razlilo

sky.NOM REFLX poured

'The sky has opened.'

d. Razlilo se nebo

poured REFLX sky.NOM

'The sky has opened.'

e. #Saobraćajna nesreća se desila.

traffic.NOM accident.NOM REFLX happened

'There was a traffic accident.'

f. Desila se saobraćajna nesreća.

happened REFLX traffic.NOM accident.NOM

'There was a traffic accident.'

In the set of unaccusative predicates, the non-canonical ordering is the preferred ordering for broad focus interpretation. In all of the SV sentences in examples (203) the default prominence falls on the verb. This facilitates the interpretation of the so-called *verum focus*

i.e., focus on the (affirmative) polarity of the sentence. Thus, one would utter sentences of this type if one wanted to confirm or emphasize the truth of the proposition. In English, this type of focus is expressed through prominence on the copula or the auxiliary: *There WAS a traffic accident, The sun IS shining, It IS raining.*

We can contrast this with the permissible order for broad focus in unergatives under a neutral intonation pattern.

(204) a. What's new?

unergatives

b. Suba plače.

Suba.NOM cries.

'Suba is crying.'

c. #Plače Suba.

cries Suba.NOM

'Suba is crying.'

d. Jovan hoda.

Jovan.NOM walks

'Jovan is walking.'

e. #Hoda Jovan.

walks Jovan.NOM

'Jovan is walking.'

The set of unergative predicates in (204) behaves in just the opposite way from the unaccusatives. Broad focus readings are only present in canonical orderings. The non-canonical ordering, VS, is interpreted as narrow focus on the subject.

We have seen that under neutral intonation, unaccusative predicates allow broad focus in VS orderings, but not in SV orderings. The following examples show that when the phrase accent falls on the subject in canonical word order, unaccusative predicates also allow broad focus. These facts are directly comparable to what we find in English.

(205) a. What's new?

b. SUBA umro.

Suba.NOM died.

'Suba died.'

c. Saobraćajna NESREĆA se desila.

traffic.NOM accident.NOM SE happened

'There was a traffic accident.'

d. SUNCE sija.

sun shining

'The Sun is shining.'

e. KIŠA pada.

rain falling

'It's raining.'

So, (205) shows that unaccusative predicates allow canonical word orders to project broad focus as long as the focus exponent is contained within the subject. Contrast this to the unergative predicates.

(206) a. What's new?

b. Suba plače.

Suba.NOM cries.

'Suba is crying.'

c. #PLAČE Suba.

cries Suba.NOM

'Suba is crying.'

d. Jovan hoda.

Jovan.NOM walks

'Jovan is walking.'

e. #HODA Jovan.

walks Jovan.NOM

'Jovan is walking.'

Unlike the sentences with the prominence on the subject of the unaccusatives, the sentences with prominence on the predicate in unergatives do not result in broad focus interpretation in any word order condition. This shows either that prosodic prominence on arguments and predicates does not "count" the same in some sense, or that prominence by

position (i.e. through word order) and “direct” prosodic prominence are not equivalent.⁷ We have already seen that prominence on a transitive verb does not project focus, and that only internal arguments may have this function. Here we see that prominence by position and prominence by prosodic distinction do not behave the same.

Stage-level vs. Individual-level Another distinction that has been argued to play a role in the focus interpretation of prominence placement is the stage-level vs. individual-level distinction. This distinction is most useful in categorizing nominal-type predicates, such as *be intelligent*, *be blue*, *be ill*, *be a guest*, *be a mother*, etc. Carlson (1977) provides arguments for this distinction on the basis of differing interpretation of bare plurals when occurring as arguments of these predicates. This predicate classification will be shown to be irrelevant for the purpose of focus projection in Serbo-Croatian.

It’s been noted by numerous scholars that in English, a stage-level intransitive predicate allows nuclear pitch accent on the subject. This property of stage-level predicates is also argued to follow from their syntactic representation (Diesing, 1992; Kratzer, 1995): subjects of stage-level predicates are generated within the VP. The focus projection algorithm, it is argued, then makes the correct prediction regarding pitch accent placement: a nuclear pitch accent on the subject, being within the VP, can project onto the VP and consequently to the sentence as a whole. This reasoning, however, blurs the distinction Selkirk (1995) makes about the internal arguments of the verb vs. the external arguments, as discussed in Chapter 2. Since the VP subject-internal hypothesis seems to be universally accepted

⁷There is a fairly long history to this idea that arguments and predicates do not “carry” the prominence in the same way, that arguments prefer to be prominent over predicates (see Ladd, 1996).

within the syntactic framework Selkirk is assuming, the stage-level vs. individual-level distinction makes the unaccusative/unergative distinction fade completely. This is because the subject of an unergative predicate is treated the same as the subject of the stage-level predicate, i.e. specifier of the VP.⁸ Under the logic that stage-level predicates allow nuclear accent on the subject, the unergative predicates ought to as well. However, we have seen that unergative predicates are different from unaccusatives and that their subjects do not allow nuclear accent to project to the sentence as a whole.

There is no difference between these two classes of predicates in Serbo-Croatian with respect to focus. Neither of them allows broad focus in the non-canonical ordering. Broad focus is only possible when the subject precedes the predicate. This is shown in (207) and (208).

(207) stage-level predicates

a. Milan je pijan/umoran/go.

Milan.NOM AUX drunk/tired/naked

'Milan is drunk/tired/naked.'

b. #Pijan/umoran/go je Milan.

drunk/tired/naked AUX Milan.NOM

'Milan is drunk/tired/naked.'

⁸If the VP-internal subject hypothesis is adopted, the syntactic encoding of this difference in terms of subjects being internal vs. external to VP cannot be maintained. Instead, the distinction must be expressed either semantically or in a different syntactic terms.

(208) individual-level predicates

- a. Milan je pametan/duhovit/Madjar.
Milan.NOM AUX intelligent/funny/Hungarian
'Milan is intelligent/funny/Hungarian.'
- b. #Pametan/duhovit/Madjar je Milan.
intelligent/funny/Hungarian AUX Milan.NOM
'Milan is intelligent/funny/Hungarian.'

Summary: We don't have any evidence from word order that the grammar relating to focus differentiates stage-level predicates from individual-level predicates (at least of the nominal type). If this is the case, then either the stage-level/individual-level distinction does not have a syntactic correlate, or there is a syntactic correlate but it does not play a role in focus projection. Recall, however, that we do have evidence that other aspects of argument structure interact with focus, since unaccusatives and unergatives behave differently with respect to focus structures under neutral intonation: unaccusatives resort to VS ordering for broad focus interpretations. In the next section, where we compare arguments to adjuncts, we will see that argument structure does play a role in focus projection in Serbo-Croatian.

The data presented in this section show that internal arguments have a privileged status with respect to focus projection, because they can project focus, whereas subjects and verbs (except for the unergative class) cannot. Under the selectional theory of focus projection such as the one developed by Selkirk and Rochemont, this is to be expected, since in this theory the focus projection algorithm is sensitive to the argument structure of the verb. Having looked at the distinction between arguments, we now turn to the distinction between arguments and adjuncts.

5.3.2 Arguments vs. Adjuncts

There seems to be a consensus among researchers that, in English, accented arguments can project focus whereas accented adjuncts cannot (Selkirk, 1984, 1995; Gussenhoven, 1983; Rochemont, 1986, 1998; Winkler, 1997).⁹ This distinction is also found in Serbo-Croatian.

I consider three types of verbal adjuncts: temporal adjuncts, manner adjuncts, and locatives. With respect to focus projection, temporal and manner adjuncts behave alike: neither of them licenses focus projection from the clause final position. When they occur in clause final position, they must be interpreted as narrow focus. For a sentence to be able to be interpreted as broad focus or VP focus, these adjuncts must occur preverbally. On the other hand, with respect to focus projection, locatives, seem to be sensitive to the aspectual property of the predicate they occur with.¹⁰ When prominent by position, locatives can license focus projection if they are modifying an imperfective predicate. We start with the temporal and manner adjuncts.

(209) a. When did Mary buy a computer?

b. Marija je kupila kompjuter prošlog meseca.

Marija.NOM AUX bought computer.ACC last month

'Marija bought a computer last month.'

(210) a. What did Mary do?

⁹For a different opinion see Kadmon (2000).

¹⁰Serbo-Croatian, like other Slavic languages, marks verbal aspect lexically. This means that most predicates come in pairs <imperfective, perfective>. The aspectual distinction is encoded through more or less regular aspectual morphology.

b. #Marija je kupila kompjuter prošlog meseca.

Marija.NOM AUX bought computer.ACC last month

'Marija bought a computer last month.'

c. Marija je prošlog meseca kupila kompjuter.

Marija.NOM AUX last month bought computer.ACC

'Marija bought a computer last month.'

If the temporal adverb, *prošlog meseca* 'last month', occurs in sentence final position in an utterance under neutral intonation, as in (209), the focus domain consists of the adverb only. That is, the prominence on the adjunct cannot project focus onto the VP. The VP-focus is possible only when the adverb precedes the verb phrase, as in (210c). This is also true of manner adverbs as well, as the examples in (211) and (212) show.

(211) a. How did Mary eat the ice cream?

b. Marija je pojela sladoled polako.

Marija.NOM AUX ate ice cream slowly

'Marija ate the ice cream slowly.'

(212) a. What did Mary do?

b. #Marija je pojela sladoled polako.

Marija.NOM AUX ate ice cream slowly

'Marija ate the ice cream slowly.'

c. Marija je polako pojela sladoled.

Marija.NOM AUX slowly ate ice cream

'Marija slowly ate the ice cream.'

These examples illustrate the fact that the canonical position for both temporal and manner adjuncts is immediately pre-verbal. In this position, these adjuncts can be interpreted as new and thus included in the focus domain, just as Rochemont (1986, 1998) argues for English as well. In non-neutral intonation, prominence on these types of adverbs in any position can only signal narrow focus on the adverb, as (213) shows.

(213) a. What did Marija do?

b. #Marija je prošlog MESECA kupila kompjuter.

Marija.NOM AUX last month bought computer.ACC

'Marija bought a computer last month.'

c. #Marija je POLAKO pojela sladoled.

Marija.NOM AUX slowly ate ice cream

'Marija slowly ate the ice cream.'

With respect to prominence and focus projection, the locative adverbs with perfective non-motion verbs behave the same way as the manner and temporal adverbs do with any predicate type. However, with (i) intransitive imperfective verbs, (ii) transitive imperfective verbs in their intransitive use, and (iii) motion verbs, locatives behave as arguments.

Consider first the difference between transitive perfective and imperfective verbs shown in (214) and (215). One of the relevant distinctions between perfective and imperfective counterparts of the same verb is the fact that transitive imperfectives regularly allow omitted objects, whereas perfectives don't.¹¹

¹¹In certain discourse conditions it is possible to omit the direct object with perfectives. For example, in some such cases, the use of a perfective verb serves the function of affirming the completion of a salient

(214) imperfective

- a. Marija je čitala knjigu.
Marija.NOM AUX read.IMPERF book.ACC
'Marija was reading a/the book.'
- b. Marija je čitala.
Marija.NOM AUX read.IMPERF
'Marija was reading.'

(215) perfective

- a. Marija je pročitala knjigu.
Marija.NOM AUX read.PERF book.ACC
'Marija read a/the book.'
- b. #Marija je pročitala.
Marija.NOM AUX read.PERF
'Marija read.'

Now, we are ready to consider the behavior of locatives in neutral intonation patterns. When they occur with intransitive verbs, (216a) and imperfective transitive in its intransitive use, (216b), they allow focus projection when positionally prominent. However, when they occur with transitive verbs, (216c), they do not allow focus projection. In the first

event, rather than reporting on a new event. If three people are waiting to leave the house, and one of them says *Come on! Let's go!*, the other one replies *Wait till Mary reads.perf the book*. One can use (215b) to point out that Mary has finished with her book and thus implicate that it is now possible to leave. But as this scenario shows, the use of the perfective form in the utterance serves the function of signalling the completion of the highly salient event and not the function of reporting the event.

two cases locatives behave as arguments, whereas in the last case they show behavior of adjuncts. With motion verbs, locatives also behave as arguments.

(216) a. What happened while I was gone?

b. Marija je živila u šatoru.

Marija.NOM AUX lived.IMPERF in tent

'Marija lived in a tent.'

c. Marija je pušila u šatoru.

Marija.NOM AUX smoked.IMPERF in tent

'Marija smoked in a tent.'

d. #Marija je popušila cigaretu u šatoru.

Marija.NOM AUX smoked.PERF cigarette.ACC in tent

'Marija smoked a cigarette in a tent.'

(217) a. What happened?

b. What did Marija do?

c. Marija je ušla u kuću

Marija.NOM AUX came into house

'Marija came into the house.'

d. #Marija je u kuću ušla

Marija.NOM AUX into house came

'Marija came into the house.'

So far, we have seen that with certain types of predicates, locatives can occur in final position and license focus projection. Does that mean that they can license focus projection if they are prosodically prominent as well? The answer again depends on the predicate. For example, if they precede a motion verb and are prosodically prominent, as shown in (218b), they can license broad focus. The same is true of the verb *živeti* 'live', but it doesn't work for the intransitive use of the verb *pušiti* 'smoke.IMPERF'.

(218) a. What's new?

b. Marija je u KUĆU ušla

Marija.NOM AUX into house came

'Marija came into the house.'

c. Marija je u ŠATORU živela.

Marija.NOM AUX in tent lived.IMPERF

'Marija lived in a tent.'

d. #Marija je u ŠATORU pušila.

Marija.NOM AUX in tent smoked.IMPERF

'Marija smoked in a tent.'

To sum up: just as in English, the distinction between arguments and adjuncts plays a role in focus projection in Serbo-Croatian. However, the traditional distinction between arguments and adjuncts (based on the semantics and optionality) is not fine-grained enough to make predictions with respect to focus projection. This is evident from the behavior of

locatives, which can project focus from the sentence final position with intransitive predicates, but when they occur with transitive predicates. From the perspective of focus projection, locatives also show sensitivity to prominence type. When prosodically prominent, they can project focus only when occurring with motion verbs and verbs of existence.

5.3.3 Semantic Types of Arguments: Pronominals vs. Full NPs

We have seen in section 5.3.1 on word order constraints that both types of internal arguments, direct and indirect object, can project focus onto the verb. In this section I show that the ability of an internal argument to project focus also depends on its semantic type. There are two types of nominal arguments that do not project focus when prosodically prominent (either by position in neutral intonation patterns, or by prosodic distinction in emotive intonation patterns): full personal pronouns and indefinite quantificational pronouns.

The failure of quantificational pronouns to project focus is illustrated in (219). The quantificational pronoun *nešto* 'something' must be either preposed, if the neutral intonation pattern is to be used, or the verb must bear prominence. English quantificational pronouns behave similarly. Notice that in English the verb must bear the nuclear accent if the direct object is a quantificational pronoun: What did you do? #*I bought SOMETHING* vs. *I BOUGHT something*. Consider Serbo-Croatian equivalents.

(219) a. What did Mary do?

b. #*Marija je kupila nešto.*

Marija.NOM AUX bought something.ACC

'Mary bought something.'

c. Marija je KUPILA nešto.
Marija.NOM AUX bought something.ACC
'Mary bought something.'

d. Marija je nešto kupila.
Marija.NOM AUX something.ACC bought
'Mary bought something.'

These examples also show that verbs are able to project focus only under two types of conditions. The verb must be unergative, or if transitive, the internal argument must be an indefinite quantificational pronoun. In all other conditions, the verb never projects focus, as we saw in section 5.3.1.

The situation with pronouns is more complex. There are four types of personal pronouns in Serbo-Croatian: clitics, full pronouns without prosodic prominence, full pronouns with prosodic prominence, zero pronouns (such as missing subjects, i.e. *pro*, and implicit objects (common with imperfective verbs, but not perfective verbs)). Of these, only full pronouns can be used deictically. I can't go into the subtle details of differences in use between clitics and full non-prominent pronouns, but the basic generalization is that clitic pronouns must be used when the antecedent is the most salient one in the discourse.

If a full pronoun occurs inside the VP and it bears prominence by position, it cannot project focus onto the verb. The only available interpretation in this case is narrow focus on the pronominal object. This situation is also reported for Spanish (Zubizarreta, 1998) and seems to be true of English as well.

(220) a. Who did Mary kiss?

b. Marija je poljubila njega.
Marija.NOM AUX kissed him
'Marija kissed him.'

(221) a. What did Mary do?

b. #Marija je poljubila njega.
Marija.NOM AUX kiss him
'Marija kissed him.'

Unlike indefinite quantificational pronouns, personal pronouns cannot stay inside the VP (see also Stojanović, 1997) if they are not narrowly focused. This means that (222c) can only be used if one wishes to convey narrow focus on the pronoun, i.e., if answering a question such as "Who did Marija greet?" Examples (222d) and (222e) can only be interpreted as having narrow focus on the verb. In other words, the verb cannot project focus, as we saw in other examples in section 5.3.1. The only way to convey VP focus is to use a clitic form of the pronoun, as shown in (222f).

(222) a. A: Did you know that Mary saw her former boyfriend the other day?

b. B: Oh yeah, what did she do?

c. #Marija je pozdravila njega.
Marija.NOM AUX greeted him.ACC
'Mary greeted him.'

d. #Marija je POZDRAVILA njega.
Marija.NOM AUX bought something.ACC
'Mary greeted him.'

e. ?#Marija je njega pozdravila.

Marija.NOM AUX him.ACC greeted

'Mary greeted him.'

f. Marija ga je pozdravila.

Marija.NOM him.ACC.CL AUX greeted

'Mary greeted him.'

These examples show that full pronouns in Serbo-Croatian cannot be used if the antecedent is highly salient, only clitic pronouns can assume the anaphoric function. Since the question is eliciting VP focus, the examples also show that full pronouns cannot be part of focus domain either.

5.3.4 Summary of Constraints on Focus Projection

As we have seen in the preceding sections, full NP (i.e., non-pronominal) arguments differ from adjuncts. The behavior of verbal adjuncts, such as time, manner, or place adverbials, is analogous to their English counterparts in many respects. The distinction between verbal full NP arguments and adjuncts strongly supports a focus projection algorithm which is based on argument structure and selectional restrictions of predicates. However, the semantic type of internal arguments affects their focus projection ability. Indefinite quantificational pronominals cannot project focus. As a result, in neutral intonation patterns they are scrambled to the left, out of the final position; in emotive patterns the verb bears

the prosodic prominence.¹² However, personal pronouns do not allow either of these adjustments. Instead, the full pronoun form must be replaced by a clitic form in order for the verb (prominent by position) to be able to project focus onto the VP.

So far, there are several descriptive generalizations regarding focus projection that emerge from the considered Serbo-Croatian data. They are listed in (223).

- (223) a. Only subjects of unaccusative verbs project.
- b. Transitive and unaccusative verbs do not project (unless the internal argument is a clitic or an indefinite quantificational pronoun).
- c. Full personal pronouns do not project.
- d. Indefinite quantificational pronouns do not project.
- e. Verbal temporal and manner adjuncts do not project.
- f. In emotive intonation patterns an internal argument of the verb can project focus onto the verb only if the verb is adjacent to it.

The Selkirk-Rochemont style algorithm captures the facts related to the argument/adjunct distinction in (223e), and the internal/external argument distinction in (223a). It does not capture the facts related to the semantic type of the internal argument, and it does not capture the difference in the verb's ability to project focus, which seems to depend not only on the semantic type of the verb but also on the semantic type of the argument (223b). I repeat here Selkirk/Rochemont's focus projection algorithm for convenience. For ease of

¹²This shows that Serbo-Croatian has two options for resolving the need to withdraw prominence from an element: either it can use the syntactic option, i.e., scrambling; or it can use the prosodic option, i.e., use non-default phrase accent placement.

reference I use the phrase "syntactic focus projection algorithm" (SFPA) to refer to these sets of rules.

(224) **Basic Focus Rule** (Selkirk, 1995, p. 555)

An accented word is F-marked.

(225) **Focus Projection** (Selkirk, 1995, p. 555)

- a. F-marking of the head of a phrase licenses the F-marking of the phrase.
- b. F-marking of an internal argument of a head licenses the F-marking of the head.
- c. F-marking of the antecedent of a trace left by NP- or *wh*-movement licenses the F-marking of the trace.
- d. If a head is [+F], then an adjunct to the head may be [+F]. (Rochemont, 1998, p. 341)

Selkirk (1995) also notes constraints on the interpretation of the F-marked constituents:

(226) **Interpretation of F-markers**

- a. The focus of the sentence (FOC) is defined as an F-marked constituent not dominated by any other F-marked constituent. (Selkirk, 1995, p. 555)
- b. F-marked constituents which are not a Focus are interpreted as *new* in the discourse. (Selkirk, 1995, p. 556)
- c. A constituent without F-marking is interpreted as *given*. (Selkirk, 1995, p. 556)

Obviously, given the generalizations presented in (223), the focus projection algorithm is not without its problems when applied to Serbo-Croatian. I think that we can easily

incorporate the changes necessary to account for the behavior of both types of pronouns, by simply appealing to their semantic type. We can also incorporate the differences in behavior of adjuncts by appealing to their argument status with motion verbs, and verbs of existence. The status of locative adjuncts with intransitive uses of transitive imperfectives is more complex and would require further semantic and syntactic analysis.

I regard the issue pertaining to the projection path of focus from an argument to the head and from the head to the phrase as the biggest problem with respect to the algorithm. We see that verbs (heads) can sometimes project focus and sometimes cannot. Whether a verb that bears prominence (either prosodically or by position) can project focus depends not only on the verb's semantic type (i.e. transitive, unaccusative vs. unergative) but at least in Serbo-Croatian, also on the semantic type of its complement: clitic vs. full pronoun, for example. The sensitivity to the semantic type of arguments does not seem to be exclusive to Serbo-Croatian. English also does not seem to allow broad focus interpretation of nuclear pitch accent placement on pronouns and indefinite quantificational pronouns, as shown in (227) and (228).

(227) a. I hear that John saw his ex-girlfriend yesterday. What did he do?

b. #John greeted HER.

c. John GREETED her.

(228) a. What did Mary do yesterday?

b. #She bought SOMETHING.

c. She BOUGHT something.

For the purpose of this thesis I will argue that the SFPA can be adequately modified to incorporate the generalizations listed in (223) and that therefore it can be applied to Serbo-Croatian. The most crucial part of the algorithm that we will focus on in the next section is the rule that allows the internal argument to transfer focus onto the verb. As the reader may recall, in section 5.3 we have shown that in emotive intonation patterns an internal argument can function as the focus exponent if adjacent to the verb, which we formulated as the Adjacency Constraint. In the next section, we look at how the syntactic structures of scrambled sentences can encode the Adjacency Constraint in such a way that the SFPA can be applied.

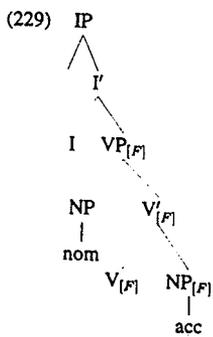
5.4 A Focus Projection Algorithm in Serbo-Croatian

5.4.1 Problems for the English-Based SFPA

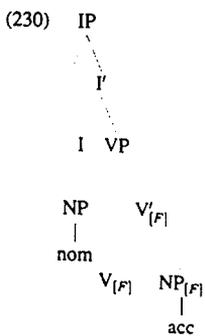
We will first look at how scrambling affects focus projection in neutral intonation patterns. As we noted in section 5.3, in neutral intonation patterns structures with canonical ordering of nominal arguments are ambiguous with respect to focus domain. In monotransitive structures, the SFPA can account for the focus ambiguity of canonical structures. For example, an SVO structure and the F-marking can be represented in the following way:

As the F-marking of the structures shown in (229), (230) and (231) indicates, all three possible focus domains follow from the SFPA. The object NP is F-marked by the Basic Focus Rule, and the VP and the sentence F-marking follow from the recursive rules of Focus Projection: the verb inherits the F-marking from its argument and the phrase inherits the F-marking from the head.

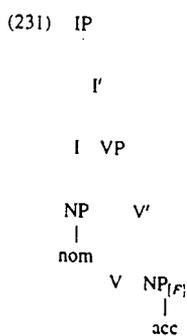
SVO
Sent.-focus



SVO
VP-focus



SVO
O-focus



The only problem with the SFPA in these examples is that in sentence focus, the subject can neither acquire F-marking through prosodic prominence nor inherit it via focus projection. Since these sentences are acceptable when the subject interpretation is new to the discourse, this creates a problem for accounting for the interpretation of subjects through F-marking. Recall that English does not have this problem because prominence is signalled by pitch accents and not phrase accents. We can propose to treat subjects in the same way Rochemont proposed for adjuncts, which is to allow subjects to inherit the F-marking from the head. This rule is shown in (232).

(232) **Subject F-marking**

If a head is [+F], then the subject of the head may be [+F] if it is within the head's projection at Surface Structure.

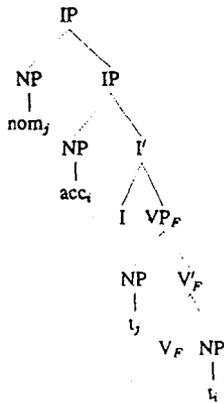
How can we account for the focus structures of the scrambled versions of monotransitive structures? We have seen that SOV and OSV structures allow only V-focus. Two possibilities come to mind for accounting for these focus structures. Either we can assume that prominent verbs do not project focus: or we can assume that in these structures, the subject and the object are scrambled outside of the VP and propose that focus projection can only go as far as the VP in contrast to Selkirk's algorithm. Since the verb is the only element inside the VP, the focus is only the verb. These focus structures are represented in (233) and (234). Limiting focus projection up to the VP node can be done by stipulating that only lexical projections can be marked by the [F] feature, and that functional projections cannot be focused. At this point we do not have evidence for choosing between these two hypothesis. However, we will see later, when we discuss focus structures of

monotransitive orderings under the emotive intonation pattern that both of these rules are needed.

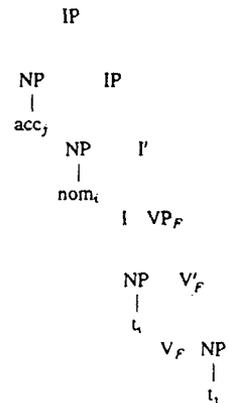
SOV

OSV

(233)



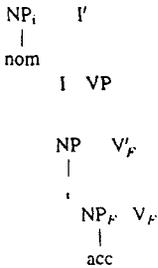
(234)



The assumption in these structures is that either the subject or the object is in the [spec IP], depending on the ordering, and the other element is adjoined to IP. We have seen in Chapter 4 that the preverbal position of the object behaves as an A-position. We have also seen in section 5.3.3 that when quantified pronouns occur preverbally, they can count as being inside the VP, since the quantified pronoun can be included into VP-focus. This suggests that there may be more than one preverbal position: one within VP, and the other outside of it. Since the direct object is not part of focus in these cases (SOV and OSV), we can assume that it is outside of VP, and that means either in the [spec IP], as in (233).

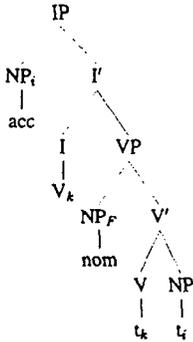
or adjoined to $\bar{I}P$, as in (234). When the preverbal object is part of focus then we can treat it either as base-generated within VP to the left of the verb, shown in (235), or assume that this ordering is derived through A-movement with the landing site within VP . The consequences should be the same in both alternatives. For the sake of simplicity, I will assume base-generation.

(235) SOV
 IP



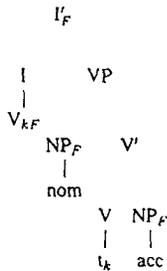
So far we have covered focus projection in SVO, SOV, and OSV. We are left with verb-initial structures and the OVS structure. In OVS structures, the subject is the only focus. We can account for this ordering and the focus structure by assuming that the verb and the object have moved outside the VP and the subject is the only element left within the VP . It acquires F-marking through the Basic Focus Rule, and there is no projection. This is illustrated in (236).

(236) OVS



In VSO structures the possible focus domains are either the whole sentence (VSO), the VP (VO), the direct object (O), or the subject and the object (<S,O>). It turns out that V-initial structures are more ways ambiguous than what is considered a canonical structure, the SVO ordering. Adopting the amendment proposed earlier where subject can acquire focus from the verb, we can account for all of these focus domains, except for the double focus case. I assume that the structure for this ordering is the one that involves movement of the verb to a higher head, either of some functional projection within the inflectional layer, or the head of the light verb. For simplicity, I will assume that the verb moves to I, as shown in (237).

(237) VSO
 IP



As the F-marking in (237) shows, we can account for the direct object narrow focus, for the VP focus, and for the sentence focus. However, we cannot account for the (<S,O>) focus. This is because, according to our amendment to the SFPA, the subject F-marking is contingent on the verb being F-marked. Thus, this interpretation is clearly outside of the predictions of the SFPA. We do not want to modify the SFPA in such a way as to allow internal arguments to be able to F-mark other arguments. Even though the same is true of ditransitive predicates, this is highly suspect because it is not general enough. It occurs only in neutral intonation patterns and never in emotive intonation patterns, and as I speculated earlier, these structures may be prosodically ambiguous.

This reasoning about generality is of course dependent upon the assumption that we are trying to use the SFPA for both intonation patterns. Keeping the SFPA as general as possible seems preferable because it would make the grammar more parsimonious. However, if we assume that the two intonation patterns are not governed by the same principles then it seems that we could account for the double-focus constructions by a rule that licenses

the F-marking of the phrase directly from an argument of the head of the phrase, shown in (238).

(238) **Phrasal Focus**

A constituent may be a focus if a constituent contained within it that is an argument of the head is prominent.

This rule is analogous to the The Phrasal Focus rule proposed by Selkirk (1984), shown in (239), but it is different from it in that it refers to a prominent argument rather than F-marked argument. I have made this change in order to avoid embedded *F*-markers, for reasons that will become obvious shortly.

(239) **Phrasal Focus Rule (Selkirk, 1984, p.207)**

A constituent may be a focus if a constituent contained within it that is an argument of the head is a focus.

By (239), a phrasal node can inherit the *F*-marking directly from an argument within that phrase. This rule differs from the one Selkirk proposed in 1995 in that in the 1995 rule the phrasal node gets to be *F*-marked via the head of the phrase, and not directly from its argument. The shift from the 1984 rule to the head-mediated one found in the 1995 article was due to the proposal made in Rochemont (1986). Rochemont (1986, p.81:101) argues that if the phrase marking does not go via the head the verb will be interpreted as given when it is supposed to be interpreted as new. This reasoning can be illustrated by the following example.

(240) a. What did John do for Mary?

- b. He sent Mary a BOOK.
- c. He F {sent Mary a {BOOK}} by (238)
- d. He F {sent Mary a F {BOOK}} by (239)
- e. He F { F {sent} Mary F {a {BOOK}}}} by (225b)

Rochemont argues that if we allow the phrase to be F-marked directly by the argument then the VP [*sent Mary a book*] is interpreted as the focus, by rule in (239), but only the direct object *a book* is interpreted as new, since that is the only constituent that has an embedded F-marker. The verb and the dative NP, *Mary*, must be interpreted as given since they are not F-marked. The denotation of the dative NP can be assumed to be given in the context since it is part of the QUD (or *c*-construable in Rochemont's terms), but the verb is not. This is inadequate, since the verb is clearly interpreted as new. Thus, for empirical reasons, Rochemont proposes that the phrase inherit F-marking from the head rather than directly from the argument. There is a theoretical advantage to this proposal as well. Since categorial and other features of phrasal projections are projections of the head, the assumption that this is also true of the focus feature unifies the focus feature with other syntactic features.

As we have just seen the issue pertaining to phrasal F-marking is tied to the role of embedded F-markers. So, Why do we need embedded F-marking at all? (in other words: Why can't the prominence on one lower element be interpreted directly as an F-marking for the constituent as a whole?) The answer to this question, as discussed in Chapter 2 lies in the assumptions pertaining to focus interpretation, and the possibility that focused

material is not always analyzed as corresponding to a syntactic constituent (Vallduví and Engdahl, 1996b; Zubizarreta, 1998; Gussenhoven, 1999).

If we assume that focus is interpreted at LF, then we are assuming that the interpretation is done off of syntactic constituents. If a VP is F-marked as in (240c), and there are no embedded F-markers, then the claim would be that the whole VP is focused, when in fact only a part of the VP is focused. According to most syntactic analyses of the double object construction, the focus domain (240b) is not a syntactic constituent. In this case focus is discontinuous (see Gussenhoven, 1999, for a discussion of and references to this issue). It consists of [*sent ... a book*]. Since this string is not a syntactic constituent at LF, under the assumption that focus is interpreted at LF, the focus is assumed to be the VP, which is the minimal phrasal node that contains both the verb and the direct object in the double object construction. So, in order to provide the correct interpretation, i.e., include both the verb and the direct object *a book* into the focus domain, embedded F-markers are put to use. Thus we see that the chain of reasoning about embedded F-markers and the phrasal projection rule leads back to the assumption about where focus is interpreted.

In Vallduví's system there are no embedded F-markers. The F-marking is only used for conveying the focus domain. We have seen in Chapter 2 that in his system focus in English does not always correspond to a syntactic constituent. In Catalan, according to Vallduví, focus always corresponds to a contiguous string, and according to his syntactic analysis does correspond to a syntactic constituent, the core IP. This analysis owes its simplicity to the syntax of Catalan, which, according to Vallduví moves elements that are not focused out of the focus domain, the core IP. Movement can be either to the left or to the right of focus domain, leaving focused elements in situ.

Since syntax of Serbo-Croatian is different from English, and is to some extent similar to Catalan, would it be possible to assume the modified phrasal focus rule of Selkirk (1984) and account for the data?

If we assume (238) we would make the claim that an argument of the head can directly mark the phrasal projection of the head if the argument is contained within the phrase. The assumption then is that there are no embedded F-markers and anything contained within the F-marked phrase would be part of focus. In the case of VSO ordering, the double focus of the subject and the object would be possible because the prominence on O would license F-marking on the VP. Since the subject is assumed to be within VP, the subject would also be focused. The verb would not be focused because it is outside the VP. There are several problems with this solution.

First, if we assume that multiple foci are truly multiple foci, rather than a single complex focus consisting of a list of variables as proposed by Zubizarreta (1998) and Krifka (1991), then we have a problem since there is only one F-marked constituent, i.e., the VP. Second, we would have to assume that VSO structures sometimes include the verb, when the whole sentence is focused, and that sometimes they don't, when we have double-focus. So far we did not make a provision for the verb to be included within the VP and also precede the subject. In addition, we would have no way of explaining VSIO structures in which the focus can be only VIO. In this case the subject is included in the F-marked VP but it is not focused. Without recourse to embedded F-marking this structure would be predicted to only have sentence focus, or "multiple foci", but never VP focus, contrary to fact. Other problematic cases with the same issues include VOSI, SVOI, OVIS, and VOIS. The last two orderings point to yet another problem for this hypothesis. Since these are

subject final structures, we would also have to allow subjects to be able to project focus. But this would be only in those cases where double-focus is possible. If we were to allow subjects to F-mark a phrasal node, we would not be able to preclude its licensing phrasal F-marking in other orderings? And yet, in all other orderings, the subject does not project focus.

To sum up, I have shown that the phrasal projection rule would not provide an adequate solution to the double-focus issue. In fact, I believe, it would create more problems than it would fix. As a result, I leave the double-focus problem unresolved, and by adopting the phrasal F-marking via the head also accept the distinction between embedded and non-embedded F-markers.

5.4.2 Refining the Algorithm: Syntactic Assumptions

5.4.2.1 Monotransitive Structures

We have seen that we can account for the correlation between word order and the focus domains in monotransitive structures under neutral intonation by moving to the left constituents out of the focus domain and by slightly modifying the SFPA. The modification included allowing the subject to be optionally F-marked when inside the VP, if the verb is. In this section, we are going to look at the correlation between word order and focus domains of monotransitive structures under emotive intonation patterns. We will see that we need to add two more assumptions to our theory. We need to adjust our conception of scrambling by assuming that a VP can be moved as well, and we also have to assume that prominent transitive verbs do not project focus. When we discussed the V-final structures in neutral intonation pattern, this solution was presented as a possibility, but there was no

strong motivation for it because limiting focus projection to VP, and moving constituents out of the focus domain was also able to account for the correlation between the word order and the available focus domains. Here, we will see that because we need to preserve the direction of the movement to be to the left for scope reasons, the option of constraining focus projection for V-prominent structures is thus necessary.

We start with the subject prominent structures, i.e., SVO, SOV, OSV, and VSO. The focus domain in all these structures consists of the subject only. There is no focus projection. This is as expected, since the subject being prominent acquires the F-marking by the Basic Focus Rule. The F-marking on the subject is not expected to be able to project focus any further.

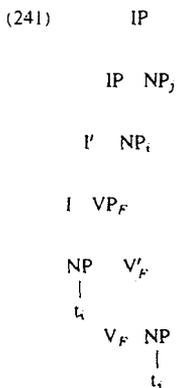
Next, we consider the verb prominent structures, i.e., SVO, OVS, VSO, and VOS. The focus domain in all of these structures is only the verb. This is as expected, given the Basic Focus Rule. However, the F-marking of the verb also licenses F-marking of the verb phrase by the Focus Projection Rule. This is clearly not what we want.

In order to account for the same word orders in the neutral intonation patterns we have assumed that in VSO structure, for example, the verb has moved to Infl and that the subject and the object are in situ within VP. We have also assumed that the verb can inherit the F-marking in this position and consequently mark the VP as focused. That allowed us to account for the focus projection facts for this word order under neutral intonation. But the possible focus domains of V-prominent structures under the emotive intonation pattern differ from the ones found in the neutral intonation pattern. We have two options for deriving the correlation. Either the syntactic structures of the word ordering in the two

intonation patterns differ, or we have to manipulate the SFPA in order to get the correct focus patterns.

If we assume that the syntactic structure is the same in both neutral and emotive intonation patterns, then one way to account for the correlation between the word order and the focus domain in the VSO ordering would be to assume that verbs cannot project focus when prominent. This assumption would have to be restricted to transitive and unaccusative verbs cooccurring with full lexical NPs. This is because, as we have seen, unergative verbs and transitive verbs cooccurring with indefinite quantificational pronouns and personal pronouns as internal arguments can project focus when prominent.

The other possibility for accounting for focus/word order correlation in neutral intonation patterns that was suggested for V-final orderings was to assume movement of constituents outside the VP and restricting focus projection up to the VP node. If we were to assume that the same solution is to apply in non-neutral intonation structures, then we would have to assume that the subject and the object have moved out of the VP (this is the mirror image of the OSV ordering). This option is available if we allow rightward movement with the landing site outside the VP. That is, the structure that we need in order to account for the lack of focus projection in V-initial V-prominent orderings is the following.



The problem with (241) is that it creates the incorrect c-command relations between the subject and the object. Since the object c-commands the subject in this structure, we make a prediction that a pronoun within the subject could be bound by a quantifier within the object, contrary to fact, as shown in (242a). If we assume that rightward movement is subject to reconstruction, as proposed by Büring and Hartmann (1997) then we fail to predict that when the object precedes the subject as in VOS, the bound variable reading is available, as shown in (242b).

- (242) a. *UDARILA je njegova_i mama svakog_i dečaka.
 hit AUX his.NOM mother.NOM every.ACC boy.ACC
 'His mother hit every boy.'

b. UDARILA je svakog, dečaka njegova, mama.
 hit AUX every.ACC boy.ACC his.NOM mother.NOM
 'His mother hit every boy.'

Although Serbo-Croatian has two other equivalents of rightward movement in English, PP extraposition and Heavy NP shift, it does not have the most typical rightward movement operation: relative clause extraposition. Extrapositing a relative clause is not grammatical, as indicated in (243b).

- (243) a. Jedan čovek koji je nosio pištolj
 one man.NOM who AUX carried gun.ACC
 je došao na izložbu koju sam juče otvorio.
 AUX came to exhibition which AUX yesterday opened.I.MASC
 'A man who carried a gun came to the exhibition I opened yesterday.'
- b. *Jedan čovek je došao na izložbu koju sam
 one man.NOM AUX came to exhibition which AUX
 juče otvorio koji je nosio pištolj.
 yesterday opened.I.MASC who carried gun.ACC
 'A man came to the exhibition I opened yesterday who carried a gun.'

The possibility of rightward movement in accounting for non-canonical word orders has been argued for Turkish by Kural (1997). Turkish is an SOV language but allows structures with postverbal elements, such as SVO and OVS. The difference between Serbo-Croatian and Turkish is precisely in the way quantifier binding works. Kural shows that in Turkish

postverbal arguments can bind preverbal arguments, which indicates that postverbal arguments are higher than the preverbal ones. Mahajan (1997), on the other hand shows that in Hindi, another SOV languages, postverbal arguments cannot bind preverbal arguments, and hence should not be analyzed as rightward moved. Serbo-Croatian is thus more like Hindi than like Turkish. This difference in binding possibilities in different word orders across languages with the same basic order shows that the possibility of rightward movement vs. leftward movement is independent of the head parameter, contrary to the hypothesis presented in Fukui (1993).

If we do not allow rightward movement out of the VP of nominal elements in mono-transitive structures, we cannot account for the lack of focus projection in V-prominent structures only by the SFPA. One way to account for the lack of focus projection in V-prominent structures is to modify the SFPA by assuming that F-marking on the verb can project onto the phrase only if it has been inherited by the focus projection rule rather than acquired through prosodic prominence by the Basic Focus Rule. By adopting this modification, we can account for both neutral and non-neutral intonation patterns of mono-transitive structures with full NPs. This solution, however, poses a problem for structures involving quantified pronouns and clitics, which require that the verb be prominent in the case of broad focus. This means that we have to add another stipulation into the SFPA which is sensitive to the semantic type of the predicate and its complement. I will present and motivate this constraint in section 5.4.3.

We still need to account for O-prominent structures, SQV, QVS, QSV, and VQS. In all of these structures the direct object constitutes a potential focus domain. This can be straightforwardly accounted for by the Basic Focus Rule. In addition to the narrow focus

of the object, VP-focus is also possible in all structures but QSV. If we assume that QSV structure involves the direct object adjoined to IP above the subject, we can account for the narrow focus of the object in the same way we need to account for the topicalized focused objects in English and German, which also do not project (Jacobs, 1991; Gussenhoven, 1992; Rochemont, 1998). Rochemont (1998) accounts for these types of examples by disallowing A' traces to be F-marked. Since topicalization is considered an A'-movement, the fact that focused topicalized elements in English do not project is accounted for. This means that the SFPA rule in (225c) must not make reference to *wh*-traces.

We are left with the other O-prominent structures in which the object projects focus onto the verb. As we noted in section 5.3, for the object to be able to project focus onto the verb the object must be adjacent to the verb. The SFPA makes a prediction that if the object is able to project focus onto the verb, the two must be a syntactic constituent that excludes the subject. In the case of SQV structure, all we need to assume is that the object is still within the VP. We need this assumption for the indefinite quantified pronouns as well. Thus the assumption that OV structures are either base generated or derived by A-movement within VP is strongly motivated.

The problematic structures under the emotive intonation pattern are those in which the subject is sentence final, i.e., QVS and VQS. If we assume that these structures are derived by leftward movement of the verb to Infl and the direct object out of the VP while the subject stays in situ, as we did for the neutral intonation structures, then the object and the V do not form a constituent that is independent of the subject. The object and the verb can form a constituent only under the analysis which allows rightward movement of the subject. An argument that rightward movement is not the right solution comes from Weak

Crossover effects. If we apply the Weak Crossover test on these structures, the rightward movement of the subject does not seem justified in either order, as shown in (244).

- (244) a. Poljubila je svakog_i MLADIĆA njegov_i devojka.
 kissed AUX every.ACC boy.ACC his.NOM girlfriend.NOM
 'His girlfriend kissed every boy.'
- b. Svakog_i MLADIĆA je poljubila njegov_i devojka.
 every.ACC boy.ACC AUX kissed his.NOM girlfriend.NOM
 'His girlfriend kissed every boy.'

Both orders in (244) allow Weak Crossover amelioration. On the assumption that c-command is necessary for quantificational binding, we have to assume that in Subject-final structures, the object c-commands the subject. This can be achieved only if the object has moved out of the VP to the left and is higher in the tree than the subject. This is the structure that we have assumed for neutral intonation pattern and WCO data show that it is correct. However, under such analysis of the syntactic structure of these word orders, we are still left with the problem of how to account for the VP focus in such orderings.

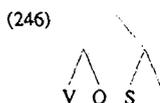
The structure that the standard assumption of scrambling and V-movement give us is the one shown in (245).

- (245)
- ```

 V
 |
 O
 |
 S

```

The structure that we need in order to explain focus projection in these orderings is shown in (246).



These two structures differ in the way they treat the VO sequence. Only in the structure in (246) is the VO sequence a constituent. Assuming a structure like that would allow us to explain the focus projection facts. This essentially means allowing a VP as a whole to be preposed rather than either preposing the object and the verb separately, or extraposing the subject. The problem with (246) is that in this structure the object again does not c-command the subject, just as in the rightward movement of the subject analysis. We have resorted to the leftward movement analysis in order to avoid the c-command problem. Since this issue comes up again with ditransitive structures we will get back to it in the next section.

To sum up, we have seen that focus projection in neutral intonation patterns of mono-transitive structures can be accounted for by the SFPA combined with leftward movement of the elements not in focus, since under the neutral intonation pattern the focus exponent is always contained within the rightmost constituent. We also had to amend the SFPA in two ways: (i) to limit focus projection up to the VP node (which can also include the subject under the VP-internal subject hypothesis and thus allow sentence focus), and (ii) to allow subjects to be F-marked if the verb is F-marked, analogous to the rule for adjuncts proposed by Rochement.

To account for the focus projection facts under emotive intonation patterns, we had to (iii) eliminate the rule that allows traces to be F-marked, and (iv) limit the transfer of F-marking from the verb up to the verb phrase to inherited F-markers only. This means that the algorithm must be able to distinguish F-markers acquired by inheritance from F-markers acquired through prosodic prominence. We noted that there is a problem with the scrambled VQ sequences, which according to the syntactic structures generated under the standard syntactic assumptions about scrambling are not a syntactic constituent. This presents a problem because with respect to focus projection they behave as constituents do. We now turn to ditransitive structures, where we see that this problem is actually more general and applies to the sequence of a verb and an indirect object as well. That is, an internal argument can project focus onto the verb only if the two are adjacent.

#### 5.4.2.2 Ditransitive Structures

There are a lot of similarities between monotransitive and ditransitive structures in neutral intonation patterns with respect to the correlations between word order and focus domains. First of all, the verb cannot project focus when placed in a prominent position, i.e. final position in a clause, in either of the structures, unless the complements are indefinite quantificational pronouns or clitics. Second, any element in final position can be interpreted as narrowly focused. Third, the subject does not project focus either, although if it is preceded by an indirect object, both can be interpreted as focused. This situation is similar to VSO and VOS structures of monotransitive clauses, where the subject and the object, independently of the verb, can be interpreted as focused as well. However, as I already mentioned, the double focus cases will remain unresolved.

So, given that we have established that neither the verb nor the subject projects focus in transitive structures with full NPs, we can safely eliminate the V-final and S-final structures out of our discussion of ditransitive structures. We are left to deal with O-final and I-final structures and their focus projection potential. We start with O-final structures.

The generalization that emerges from the O-final structures is that as long as the canonical order of nominal elements is preserved, i.e., SIO (S=subject, I=indirect object, O=direct object), the O can project focus up to the whole sentence. As far as the distribution of F-markers is concerned we have the same problem with the indirect object as we did with the subject in monotransitive structures. Neither can inherit the F-marking from the direct object according to the SFPA. If we look at the focus domain possibilities, we see that the subject and the indirect object are interpreted as new as long as the verb is too. So, we can then make the same amendment to the SFPA for the indirect object as we proposed for the subject. That is, the indirect object can be F-marked if the verb is, as in (247). This likens subjects and indirect objects to adjuncts, as this proposal was originally made only for adjuncts in English by Rochemont (1986).<sup>13</sup> The assumption needed for the focus projection up to the sentence level, i.e., sentence focus, is that all elements are inside the VP.

(247) **Indirect object F-marking**

If a head is [+F], then the subject of the head may be [+F] if it is within the head's projection at the Surface Structure.

---

<sup>13</sup>As Peter Culicover (p.c.) points out, subjects, adjuncts and indirect objects are a natural class in GB theory. They are those elements of a sentence that are not governed by the verb (or not L-marked in the Barrier's framework).

The problematic cases in neutral intonation patterns are IVSO, ISVO, and VISO orderings. The focus domain in these orderings is the O. If we assume that the direct object is the only element left inside the VP, then we have to account for the structure which requires that the verb and the indirect object and the subject be outside the VP and also insure that the verb cannot inherit F-marking from the direct object. In V-initial structures with the canonical ordering of the nominal arguments, we have assumed that the verb has moved to I and we have also allowed the verb to inherit the F-marking from the direct object. So, how can we prevent the same thing from happening in IVSO, ISVO, and VISO orderings?

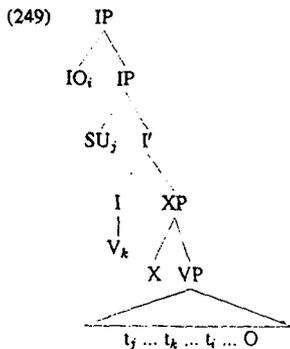
Rochement (1998, p.344) argues that F-marking has properties of head-movement. This claim is based on the resemblance of the argument/adjunct asymmetry in focus projection to movement because the same asymmetry is found in the theory of movement: it is possible to move an element out of an argument but not out of an adjunct. On the assumption that the resemblance is not coincidental, focus projection can be reduced to movement. Given that the movement is from an argument to the head, it seems reasonable to assume that it is head-movement. If we adopt this claim, and if we assume that movement of nominal elements out of the VP into the specifier positions of the functional layer of the clause activates the head positions within the functional layer, then we can reason that by the Head Movement Constraint, given in (248), F-marking cannot be inherited by the verb because of the presence of the intermediate functional heads that preclude movement. This stipulation then accounts for all the cases of O-final orderings.

(248) **Head Movement Constraint**

a. A head category can only move to the head position immediately preceding it.

(Ouhalla, 1991)

Let me illustrate how this works. The O-final orderings that are covered by the Head Movement Constraint are IVSO, ISVO, and VISO. In all of them the focus domain is restricted only to O. If projection of F-marking is an instance of head movement, then in ISVO ordering, the F-marking cannot "move" to the head V because the indirect object and the subject have moved out of the VP and hence activated the heads of the functional projections within the inflectional layer. The V then is not the closest head and thus by the Head Movement Constraint, the F-marking cannot reach the verb. The same is true of ISVO and VISO.



We move to I-final orderings. The peculiarity of I-final orderings is that in addition to I as the focus domain, I can project focus only to the verb phrase that does not contain the direct object. If the subject is also within the VP then the subject can also be in focus, as long

as the verb also is.<sup>14</sup> This is, by now, a familiar situation and we have already accounted for it by our amendment to the SFPA which says that subject F-marking is licensed if the verb is also F-marked and the subject is still within the VP.

The situation that we find here seems to show that in transitive structures the direct object is the first choice for the role of the focus exponent for a VP, the indirect object is the second choice, and the verb is the last choice. The verb can assume that function only when there is no argument that can assume that function. That is, a verb with an overt projectable argument cannot itself project focus.<sup>15</sup>

To sum up: We have seen that in ditransitive structures both types of internal arguments can transfer focus onto the verb, although under different conditions. For an indirect object to be able to transfer focus onto the verb, the direct object must not be within the focus domain. Furthermore, we have seen that the verb can license focus on the subject and the indirect object, as long as these are within the VP. Movement of the nominal arguments outside of the VP blocks the inheritance of F-marking to the verb. We have stipulated that under the assumption that F-marking shares properties of head-movement, we can account for this by the Head Movement Constraint if we assume that movement of the nominal elements outside the lexical VP projection activates the heads within the functional layer

<sup>14</sup> I am ignoring the <S,I> focus domains, for the same reason as discussed for other multiple foci possibilities. That is, for reasons of potential prosodic ambiguity.

<sup>15</sup> As I noted before there is a functional difference between English and Serbo-Croatian with respect to verb prominence (except in unergatives). In Serbo-Croatian verb prominence can always indicate *verum focus*, i.e., affirmation of the truth of the proposition. In English, this function is served by the auxiliary verbs, rather than the main verbs. Serbo-Croatian cannot use the auxiliaries for this purpose because they are phonologically clitics and so can never be prominent. Thus, it seems that avoidance of verb prominence for signalling focus is in part tied to the difference in the phonological status of the auxiliaries versus main verbs.

of the clausal projection. We now move to the issues relating to ditransitive structures under the emotive intonation patterns.

At the outset, we have eliminated the patterns involving verb prominence and subject prominence. This is because we have found that neither of these elements are able to project focus. Thus, we are left to examine two types of orderings: those in which the direct object is prosodically prominent and those in which the indirect object is prosodically prominent. In section 5.3 we have tabulated the correlation between the word order and the focus domain. We will only discuss the O-prominent orderings since the I-prominent orderings are directly comparable to these.

In addition to the narrow focus of the direct object, these orderings show that direct objects can project focus onto the verb as long as the verb is adjacent to the direct object. One exception to the adjacency constraint is the VIQS ordering. We first discuss the VIQS ordering and then we will discuss the adjacency condition.

The VIQS ordering has a potential for three (nested) focus domains: VIO, VO, O. In other words it behaves as the standard focus projection within a VP. We have seen that in the neutral intonation pattern this ordering allows only the subject to be the focus. We have assumed that the syntactic structure of this ordering involved the subject in situ and all other elements moved outside the VP. However, this was not necessary in order to account for the focus projection in neutral intonation pattern. Subjects do not project anyway, because they are in the specifier position of the VP, and not the complement position, like internal arguments. The condition that guided our assumption about the position of the subject in subject-final sentences was c-command. Since the subject in the sentence-final position does not c-command anything that precedes it, and is c-commanded by the

preceding material, it seems inevitable to assume that they are low in the tree. Thus the only option seems to be that they are in situ within the VP. If so, then there are two options for deriving the VIOS ordering. Either the whole inner VP is moved, or the elements are moved individually. Moving the entire lower VP seems a more attractive solution since the focus projection facts can follow directly without any stipulation. So, then the question is whether we can argue for VP preposing or not.

Based on clitic placement in Serbo-Croatian, many scholars have argued against VP preposing (topicalization in their terminology) (Browne, 1974; Rivero, 1991, among others), as shown in (250).

- (250) a. \*Čitao knjigu sam  
 read book.ACC AUX.CL  
 'I read the book.'
- b. Čitao sam knjigu  
 read AUX.CL book.ACC  
 'I read the book.'

(250a) is ungrammatical because the clitic must occur after the first accented word, the verb in this case. Since the clitic is an auxiliary and according to Rivero (1991) heads its own projection, it is not a part of the VP. The clitic intrusion within the VP is interpreted as evidence for V-movement instead. However, if we assume that clitic placement is partially driven by phonological requirements as argued by many (Radanović-Kocić, 1988; Halpern, 1995; Bošković, 2000a, *inter alia*) then it seems reasonable to assume that VP preposing is possible and that clitic placement is not evidence against it. Consequently, under the VP-preposing analysis, the focus projection within VIOS structure is accounted for.

We can assume a similar solution to the projection facts in VQIS, and VQSI orderings, where only the VO domain can be interpreted as focused. That is, the VO constituent is preposed and focus projection operates within that constituent.

There is one problem with this analysis, though. As I already noted in the previous section, the elements within the fronted VP do not c-command the subject at S-structure. We have seen, however, that all these structures allow either the direct object or the indirect object to bind the pronoun within the subject, which seems to indicate that c-command condition on binding is satisfied. If we can stipulate that the conditions on quantification binding require precedence at S-structure and c-command at LF, then by quantifier raising at LF we would satisfy both conditions. There seems to be some evidence for this possibility. LF-movement of quantifiers is independently needed in Serbo-Croatian because their surface structure position is not sufficient for their interpretation. For example, in multiply quantified sentences, the quantifier scope is ambiguous and hence the surface structure cannot serve as the input to quantifier scope interpretation. This is illustrated in (251) and (252), where it is shown that both interaction of two quantified NPs and a quantified NP with a *wh*-operator is possible.

(251) Nešto je svakog djaka ujelo na izletu.  
something.NOM aux every.ACC pupil.ACC bit at picnic

'Something bit every student at the picnic.'

For every student there was something that bit him.

(252) Šta je svako kupio za Petra?

what.ACC aux everyone.NOM bought for Petar

'What did everyone buy for Petar?'

'For every person, what did they buy for Petar?'

In addition to quantifier scope ambiguity, illustrated in (251) and (252), there are examples in which the quantifier scope is fixed, although it is inverse of the scope given by surface position of the quantifiers. An example of the so-called inverse scope reading is given in (253). For a more in depth discussion and additional arguments for LF movement of quantified expressions in Serbo-Croatian see Godjevac (to appear).

(253) 1988 svaki penzioner u jednom vojvodjanskom

1988 every.NOM pensioner.NOM in one vojvodina.POSS

selu je glasao za Miloševića.

village aux voted for Milošević

'In 1988, every pensioner in one village in Vojvodina voted for Milošević.'

\*every pensioner > one village, one village > every pensioner

Thus, I will assume that some version of the above stipulation is correct and that after QR, the c-command condition would be satisfied, which then accounts for the data.

We are now left with other O-prominent structures that allow focus projection (QVSI, QVIS, ISQV, IQVS, IVQS, SVQI, SIQV, and SQVI). In all of these, the descriptive generalization is that the direct object can project focus to the verb if the verb is adjacent to the direct object. How can we account for this fact?

In the discussion of monotransitive structures I have made an assumption that OV structures can be thought of as base generated, or derived by A-movement within the VP. In

either case the OV sequence can be treated as a constituent. If so, then we can further assume that this constituent has been fronted. The consequences of this assumption are the same as for the previously discussed orderings. If we don't assume constituency of OV structures, however it is derived, then we have to account for the adjacency condition.

There are two well-known ways of encoding adjacency within generative grammar. One of them is the solution we have already been exploiting, which is the head-complement relation, or constituency. The other possibility is the head-specifier agreement, which has been used in much recent work in the generative grammar for encoding a number of properties that were previously handled through the notion of government. For example, Case assignment, *Wh*-Criterion, and Neg-Criterion have been encoded as checking of Case/*Wh*/Neg features in a spec-head configuration (Chomsky, 1991; Rizzi, 1991; Haegeman, 1995). In addition to these grammatical properties, adjacency requirement in relation to focus has also been encoded through spec-head agreement within the functional projection FocusP (see Brody, 1990; Choe, 1995; Tsimpli, 1995; Rizzi, 1997).

Postulating a functional projection FocusP for Serbo-Croatian seems like a plausible alternative to encoding the adjacency requirement between the direct object and the verb that would also not require base generation of OV structures. This analysis would assume a structure such as the one shown in (254)

(254) XP

FocP

NP<sub>i</sub> F'

F WP

W VP

... t<sub>i</sub> ...

The direct object would move to [spec FocP] to check off its focus feature and the verb would adjoin to the functional head F. Thus, the adjacency requirement between the direct object and the verb would be encoded as the spec-head agreement within the FocP. This type of analysis has been used to explain the narrow focus on the NP occupying the specifier position of the FocP in Hungarian, Korean, Greek, Italian, among others. However, this type of an analysis has not been used to explain focus projection from the NP to the verb, in which the two constitute a focus domain, i.e., a constituent denoting a predicate which is interpreted as focused. Because of this interpretational requirement, it seems preferable to encode the adjacency constraint through constituency rather than (spec-head) agreement.

The analysis in which the OV sequence is a constituent is based on the assumption that it can be base-generated (or the object is A-moved, if we allow argument shift within the VP as was needed for quantificational pronouns), that VP preposing is allowed, and that the lack of the c-command is circumvented by additional stipulation about quantificational binding and a necessary rule of quantifier raising.

### 5.4.3 Refining the Algorithm: Sensitivity to Semantic Type

We have seen in section 5.3.3 that if the focus exponent is a personal pronoun or an indefinite quantificational pronoun, F-marking does not project beyond that NP. In other words, when a prominent internal argument is a personal pronoun or an indefinite quantificational pronoun, the utterance is interpreted as narrow focus on that argument. Thus it was suggested that the SFPA must incorporate this sensitivity to a semantic type of the constituent containing the focus exponent. We have also seen in previous sections that a prominent verb does not project focus, unless it belongs to the unergative class. I have argued that we also need to incorporate a restriction on focus projection from prominent verbs in order to account for the correlation between word order and focus domains in transitive structures under neutral intonation pattern. The question that I want to address in this section is whether we need both of these constraints.

The reason this question is pertinent is because the projectability of verbs depends on the semantic type of its internal argument. Consider the following examples. I have shown that when a full NP subject of an unaccusative verb is prominent, either prosodically or by position, it can signal sentence broad focus, whereas when a non-unergative verb<sup>16</sup> is prominent, either prosodically or by position, the focus is narrow. This is illustrated in (255). Thus, the conclusion this data supports is that unaccusative verbs do not project broad focus. However, if the form of the subject is an indefinite quantificational pronoun, the facts about prominence-focus relation are reversed. Only prominence on the verb can

<sup>16</sup>Unergative verbs are able to project focus.

signal broad focus. This is illustrated in (256). The same distinction is present with mono-transitive and ditransitive verbs as well, shown in (257) and (258).

(255) a. What happened?

b. #Milan je stigao.

Milan.NOM AUX arrived

'Milan arrived.'

c. Stigao je Milan.

arrived AUX Milan.NOM

'Milan arrived.'

d. MILAN je stigao.

Milan.NOM AUX arrived

'Milan arrived.'

e. #STIGAO je Milan.

arrived AUX Milan.NOM

'Milan arrived.'

(256) a. Neko je stigao.

someone.NOM AUX arrived

'Someone arrived.'

b. #Stigao je neko.

arrived AUX someone.NOM

'Someone arrived.'

c. #NEKO je stigao.  
someone.NOM AUX arrived  
'Someone arrived.'

d. ?STIGAO je neko.  
arrived AUX someone.NOM  
'Someone arrived.'

(257) a. What's new?

b. #Milan je kupio nešto.  
Milan.NOM AUX bought something.ACC  
'Milan bought something.'

c. Milan je nešto kupio.  
Milan.NOM AUX something.ACC bought  
'Milan bought something.'

d. Milan je KUPIO nešto.  
Milan.NOM AUX bought something.ACC  
'Milan bought something.'

(258) a. What happened here?

b. #Direktor je poklonio nekome nešto.  
the boss.NOM AUX gave someone.DAT something.ACC  
'The boss gave something to someone.'

- c. Direktor je nekome nešto poklonio.  
 the boss.NOM AUX gave someone.DAT something.ACC  
 'The boss gave something to someone.'
- d. #Nekome je nešto direktor poklonio.  
 the boss.NOM AUX gave someone.DAT something.ACC  
 'The boss gave something to someone.'
- e. ?Direktor je POKLONIO nekome nešto.  
 the boss.NOM AUX gave someone.DAT something.ACC  
 'The boss gave something to someone.'

The difference in the way broad focus is signalled in (255) and (256) supports the hypothesis that the constraint that prohibits verbs from projecting focus when prominent is not absolute. These data show that a verb's inability to project focus is relative to other properties of the constituents within the focus domain. It correlates with at least another property: the prominence-bearing potential of its internal argument(s). This property relates to the fact that indefinite quantificational pronouns cannot function as the focus exponent. We have also noted that this is true of full personal pronouns as well. Do these two types of expressions belong to a natural class?

Personal pronouns and indefinite quantificational pronouns differ in one crucial respect. Personal pronouns are inherently anaphoric. This means that they inherently denote "given" information. In that sense, it seems reasonable that they cannot be the focus exponent, unless they constitute the sole focus. This is also true of other elements denoting given information. Consider the following example.

(259) a. Who did you hit when the woman walked in?

b. I hit THE WOMAN.

(260) a. What did you do when the woman walked in?

b. #I hit THE WOMAN.

The reason the utterance *I hit the WOMAN* is infelicitous in (260) but not in (259) is because in the context of (260a) the NP *the woman* is expected to function as the focus exponent. In the context of (259a) it is not required to project and the result is perfectly acceptable. This shows that if an accented constituent denotes given information it cannot project focus, but it can be the sole focus. Thus, the behavior of personal pronouns is identical to behavior of other types of NPs that denote given information. Personal pronouns are distinguished because they inherently denote given information.

Indefinite quantificational pronouns, on the other hand, inherently denote "new" information.<sup>17</sup> This difference shows that personal pronouns and indefinite quantificational pronouns may not constitute a natural class with respect to prominence-bearing potential relevant for focus.<sup>18</sup> Thus it is conceivable that the behavior of the two may not represent a single phenomenon.

I will argue that when the only internal argument is a full personal pronoun, the prominent verb does not project focus, rather the focus is narrow because the full pronouns cannot

<sup>17</sup>If we assume that indefiniteness is a property related to "novelty" as defined in Heim (1982), that is, novelty with respect to common ground, rather than with respect to QUD, then this sense of "new" is different from the one relevant for focus.

<sup>18</sup>I am not claiming that these elements cannot bear prominence. They certainly can. The issue is whether they can bear prominence relevant for projecting focus beyond their own maximal projection.

be part of focus in Serbo-Croatian, as discussed in section 5.3.3. The case in which the internal argument is an indefinite quantificational pronoun, the prominent verb does project focus. Thus the difference is in the size of the focus domain.

In Chapter 2 we have seen that expressions that denote given information are deaccented in English. If we assume that pronouns inherently denote given information, then we can assume that unless they are the focus, they must be "deaccented". I have already pointed out in Chapter 2 that deaccenting in English seems to be a heterogeneous class of phenomena. The case of these two types of pronouns discussed here also provides evidence for that hypothesis.

As we can deduce from our examples above, Serbo-Croatian has two analogues of English deaccenting. In utterances under neutral intonation, movement to the left of a constituent denoting given information is one type of an analogue of English style deaccenting. The other form of "deaccenting" in Serbo-Croatian is directly analogous to English, it involves keeping the word order constant but shifting to the left the placement of the phrase accent.

The cases in which the verb can project focus in Serbo-Croatian are those in which no internal argument can bear prominence, for example sentences with indefinite quantificational pronouns as internal arguments. In these cases, it is not the case that the verb has been promoted to bearing prominence, rather it is the internal argument that must be demoted from bearing prominence. One of the crucial questions to ask is: Why do these indefinites avoid prominence? However, at this point I don't have an explanation for this fact and it simply must be stipulated. One of the functional explanations offered by Bolinger that seems applicable here is semantic weight. Expressions with low semantic weight do

not bear prominence. According to Bolinger, semantic weight is a function of redundancy. Certain words in certain contexts are redundant and hence carry low semantic weight, i.e., they add very little information. Indefinite quantificational pronouns seem to qualify for that description because, they add very little information beyond the syntactic satisfaction of the thematic requirements of the verb.

I will assume that when the verb bears prominence due to the low semantic weight of its complement that these are examples par excellence of "deaccenting". There are two reasons for this. First, in these cases the focus is always broad and cannot be reanalyzed as narrower focus. Second, the quantificational pronouns are interpreted as new, i.e., F-marked, even though there is no provision for their acquiring the F-marking via the SFPA: the verb acquires the F-marking by the Basic Focus Rule, but this F-marking on the verb does not license the F-marking of its complements, it can only license the F-marking of the phrase. In other words, the distribution of the F-marking within this kind of deaccented verb phrase behaves as if the prosodic prominence was associated with the internal argument.

I have argued in Chapter 2 that some cases of deaccenting in English, discussed in the literature, involve mistaken delineation of the focus domain. Selkirk's "sketches" example is one such example. In Chapter 2, I have also discussed Vallduví and Engdahl's "chocolate" example, repeated here in (261), in which the verb bears focal prominence. According to Vallduví and Engdahl, the focus domain in this example contains the subject NP and the verb. I have argued instead that the focus domain in this example is just the verb. If we assume that the subject is a part of the focus domain, as Vallduví and Engdahl claim then according to the SFPA, the focus domain must be the sentence. The reason the object NP

is not within the focus domain in Vallduví and Engdahl's analysis is because it is given in the immediately preceding context. Under the SFPA analysis the direct object NP is within the focus domain, but it is not accented because it denotes given information. According to deaccenting theories, the absence of an accent on this NP, is a case of deaccenting. But this is precisely where the difference lies between this case and the case of deaccenting of indefinite quantificational pronouns. The indefinite quantificational pronouns must be interpreted as F-marked, whereas the denotation of the NP *chocolate* must be interpreted as not F-marked. Thus, if we want to subsume both of these cases under deaccenting, they must be treated as two different types of deaccenting.

(261) Context: You shouldn't have brought chocolate to the White House.

- a. The president HATES chocolate.
- b.  $\mu$ [The president HATES] chocolate.
- c.  $\mu$ [The president  $\mu$ [ $\mu$ [HATES] chocolate]]

However, there are reasons to believe that the "chocolate" example is not actually the case of deaccenting at all. I questioned the just sketched analysis of both theories for two reasons. First of all, if we adopt the assumption that information can be given by virtue of entailment then the denotation of the subject NP is also given by virtue of the mention of *the White House*. If so, then by the same reasoning applied to the NP *chocolate* in Vallduví and Engdahl's analysis, the subject NP need not be included in the focus domain. This leaves the verb as the sole focus domain in this example. In other words, the implicit question that (261a) is answering is "How does the president feel about chocolate?"

The second reason for questioning both analyses involves Serbo-Croatian correlate of this example. The most natural continuation within the above context involves those word orders and those prominence placement strategies in which the verb is the sole focus domain, as the analysis of the previous examples would predict. This is shown in (262).

(262) a. You shouldn't have brought chocolate to the White House.

b. #Predsednik mrzi čokoladu. SVO

president.NOM hates chocolate.ACC

'The president hates chocolate.'

c. Predsednik čokoladu mrzi. SOV

president.NOM chocolate.ACC hates

'The president hates chocolate.'

d. Čokoladu predsednik mrzi. OSV

chocolate.ACC president.NOM hates

'The president hates chocolate.'

e. Predsednik MRZI čokoladu. SVO

president.NOM hates chocolate.ACC

'The president hates chocolate.'

f. MRZI predsednik čokoladu. VSO

hates president.NOM chocolate.ACC

'The president hates chocolate.'

...

We have independently established that verb prominence signals only narrow focus on the verb if the internal argument is not an indefinite quantificational pronoun. Given the above specified context the examples in (262) are able to occur, this suggests that prominent verbs do not project focus onto the verb phrase when the internal argument denotes given information. This leaves us with the indefinite quantificational pronouns as the only case when the internal argument NP is included within the focus domain, it does not bear prominence, but is interpreted as F-marked. In other words, a non-F-marked internal argument in monotransitive structures cannot be included into the focus domain. In contrast, it seems that external arguments (subjects) and adjuncts can be included in the focus domain even when they are not F-marked. The generalization that these facts embody is the following: A potential focus exponent cannot be included in the focus domain unless it is prominent. In unaccusative and monotransitive structures, the internal argument is the only possible focus exponent. In ditransitive structures, either of the two internal arguments can function as focus exponents, although there is a hierarchy of projectability: the direct object is ranked higher as a potential focus exponent than the indirect object. The verb can be a focus exponent in unergative structure, since there are no internal arguments.

In order to account for the behavior of quantificational pronouns, personal pronouns and prominent verbs the SFPA needs to be modified. The following set constraints represents the modified version of the SFPA.

(263) **Indefinite Quantificational Pronouns**

- a. An NP is an indefinite quantificational pronoun iff it belongs to the following set: *neko* 'someone', *nešto* 'something', *negde* 'somewhere', *nekako* 'somehow', *nekad* 'sometime'.

(264) **Basic Focus Rule** (Selkirk, 1995, p. 555)

An accented word is F-marked.

(265) **F-marking**

- a. F-marking is acquired iff it is acquired by the Basic Focus Rule.  
b. F-marking is inherited iff it is not acquired by the Basic Focus Rule.

(266) **Focus Projection**

- a. Inherited F-marking of the head of a phrase licenses the F-marking of the phrase.  
b. Acquired F-marking of the head of a phrase licenses the F-marking of the phrase iff all internal arguments of the head belong to the class of indefinite quantificational pronouns.  
c. F-marking of an internal argument of a head licenses the F-marking of the head.  
d. If a head is F, then an adjunct to the head may be F. (Rochemont, 1998, p. 341)

**Indirect object F-marking**

- e. If a head is [F], then the indirect object of the head may be [F] if it is within the head's projection at the Surface Structure.

### Subject F-marking

- f. If a head is [F], then the subject of the head may be [F] if it is within the head's projection at the Surface Structure.

The above set of constraints incorporates the noted sensitivity to the semantic type of internal arguments into the SFGPA. In order to account for non-projectability of personal pronouns and other constituents denoting given information we need the following constraint.

#### (267) Sole Focus

If a constituent denoting given information is accented it is the sole focus of the sentence.

## 5.5 Conclusions

In this section I have shown that focus projection in sentences with scrambled orders in both main types of intonation patterns can be accounted for by the SFGPA provided that certain amendments are incorporated. These include (i) the assumption that focus projection stops at the VP node, (ii) optional transfer of F-marking from the verb to the subject and the indirect object; (iii) the assumption that traces are invisible for the purpose of F-marking, (iv) the distinction between two types of F-marking: those that are acquired through prosodic prominence and those that are inherited, (v) semantic sensitivity to indefinite quantificational pronouns, and (vi) the sole focus constraint.

In addition to the modification of the SFGPA, we also had to make additional assumptions about scrambling. We assumed that internal arguments of the verb can be base-generated

(or A-moved) in any order and can freely combine with the verb as a constituent. This constituent is further free to prepose. There are two arguments against the preposing of the inner VP: one pertains to clitic placement, and the other to scope of the quantificational NPs within the preposed constituent. I have argued that there are independent grounds for positing quantifier raising at LF in Serbo-Croatian and thus the second objection can be solved by this independently needed mechanism. As far as clitic placement is concerned, its surface position seems to provide evidence for both syntactically sensitive placement and for prosodically sensitive placement. At this point there are no clear-cut arguments for either solution. On the assumption that the clitic-placement objection can be dealt with adequately, I have shown that a focus projection algorithm based on the argument structure of the predicate can be implemented in a scrambling language such as Serbo-Croatian.

Certain modifications of the SFPA, such as the Subject Focus Marking, and the Indirect Object Focus Marking are clearly specific to Serbo-Croatian. This modification seems to be related to the difference in the type of prosodic prominence between English and Serbo-Croatian. The prosodic marking of prominence in Serbo-Croatian is (the L-) phrase accent rather than a pitch accent. English, and other Germanic languages that use a post-lexical pitch accent, mark the subject and the indirect object directly by prosodic prominence rather than through inheritance of F-marking from the predicate.

Other modifications of the SFPA, such as the sensitivity to the semantic type of the argument seems to have a more general character. We have seen that even English shows the same type of sensitivity. Consequently this property of the modified SFPA is of a more interest for the crosslinguistic comparisons in the search for the linguistic universal.

I have also shown that there is some notion of relative projectability of different elements in a Serbo-Croatian sentence. This relative projectability is manifested as a hierarchy of possible focus exponents. The direct object is the highest on this hierarchy, the indirect object lower, and the verb and the subject are the lowest. This superiority of the internal arguments is precisely what the SFPA is all about: sensitivity to argument structure. Consequently, this is another element of the algorithm that proves to be quite general. To what extent this characteristic is dependent on the type of prosodic prominence is still too early to tell. Before we can answer this question we need to look more closely at focus projection properties of languages that do not mark prosodic prominence by either a pitch accent or a phrase accent. It is conceivable that this type of focus projection is sensitive to the more general notion of accentuation, and that the sensitivity to argument structure is contingent on it.

## CHAPTER 6

### CONCLUSIONS

#### 6.1 Summary

This thesis is one of the first in-depth analyses of a focus system which makes extensive use of both intonation and word order for marking focus.

On the empirical side, this dissertation has investigated the nature of focus and focus projection in Serbo-Croatian. The primary concerns were the prosodic and syntactic properties of focus marking and the relationship between focus marking and focus domain, i.e., focus projection. As a result this investigation presents a study interfacing three fields of linguistics: pragmatics, intonation, and syntax.

The so-called free word order of Slavic languages has always been related to the pragmatic notions such as topic and focus (see *inter alia* Sgall et al., 1986; Holloway-King, 1995, for Czech and Russian, respectively). I have shown that Serbo-Croatian has two means of marking focus: position (i.e., word order) but prosodic prominence (i.e., prosodic distinction).

On the theoretical side, the two main claims in this dissertation are: (1) that these two types of focus marking are subject to the same set of constraints on focus projection and (2) that the relationship between focus marking and focus domain is syntactically constrained.

In addition, I have shown that the assumption that focus is a syntactic constituent has a consequence for the syntactic analysis of scrambling. It motivates the treatment of scrambling as an operation which not only includes NP arguments but also a VP.

These findings are important for several reasons. First, it shows that syntactic means of signaling focus are not independent of prosodic cues, as has been previously claimed for positional focus languages (Kiss, 1995; Vallduví, 1992; Kidwai, 2000). Second, it shows that differences in focus marking do not necessarily establish differences in the focus–prominence relation. English uses a pitch accent for marking focal prominence, whereas Serbo-Croatian employs a phrase accent. Nevertheless, the focus–prominence relation in both languages obeys a syntactic focus projection algorithm. Third, it shows that syntactic analysis of free word order languages is dependent on both intonation and focus domain assignment and thereby initiates a new methodological approach into study of the syntax of scrambling languages.

## **6.2 Outlook**

This thesis is also an initial step towards a more comprehensive analysis of the prosody and the various functions of word order in Serbo-Croatian, as well as of the interaction between the two. However, there are a number of issues that this research program needs to explore in more detail before a more complete picture emerges. For instance, for a full understanding of the focus system, the notion of topic and topic signalling must be integrated with the focus system. Furthermore, since topic signalling is also dependent on prosody and word order, any complete account will have to deal with both simultaneously.

Another domain that has been noted in the literature (see Tancredi, 1992; Merchant, 1999) as tightly related to both topic and focus is the domain of various types of ellipsis. Thus a more tightly interwoven grammatical system would also have to connect the topic and focus system to a more general system of deletion.

Somewhat more remotely, understanding focus is a crucial first step towards a deeper understanding of definiteness. What makes definiteness in the Slavic languages mysterious is that it is not grammaticalized in the determiner system (as in languages like English), and its effects span both information structure and the verbal aspectual system. Therefore a comprehensive treatment of focus and topic as they relate to prominence provides an approach to definiteness.

## Appendix A

### DATA

#### A.1 Ditransitive Predicates in Neutral Intonation Pattern

- (268) a. What happened?  
b. What did Marija do?  
c. What did Marija do for Jelena?  
d. What did Marija give Jelena?  
e. Marija je Jeleni poklonila novi kompjuter. SIVO  
Mary.NOM aux Jelena.DAT gave new.ACC computer.ACC  
'Mary gave a new computer to Jelena.'
- (269) a. Who did Marija give a new computer?  
b. Marija je poklonila novi kompjuter Jeleni. SVOI  
Mary.NOM aux gave new.ACC computer.ACC Jelena.DAT  
'Mary gave a new computer to Jelena.'
- (270) a. What did Marija do with the new computer?  
b. Who did Marija give a new computer to?  
c. Marija je novi kompjuter poklonila Jeleni. SOVI  
Mary.NOM aux new.ACC computer.ACC gave Jelena.DAT  
'Mary gave a new computer to Jelena.'

- (271) a. Did Marija charge Jelena for the new computer?  
 b. (Ne,) Marija je novi kompjuter Jeleni poklonila. SOIV  
 (no,) Mary.NOM aux new.ACC computer.ACC Jelena.DAT gave  
 '(No,) Mary gave a new computer to Jelena.'
- (272) a. Did Marija charge Jelena for the new computer?  
 b. (Ne,) Marija je Jeleni novi kompjuter poklonila. SIOV  
 (no,) Mary.NOM aux Jelena.DAT new computer gave  
 '(No,) Mary gave a new computer to Jelena.'
- (273) a. What did Marija give to Jelena?  
 b. Jeleni je Marija poklonila novi kompjuter. ISVO  
 Jelena.DAT AUX Marija.NOM gave new.ACC computer.ACC  
 'Marija gave a new computer to Jelena.'
- (274) a. Did Marija charge Jelena for the new computer?  
 b. (Ne,) Jeleni je Marija novi kompjuter poklonila. ISOV  
 (no,) Jelena.DAT AUX Marija.NOM new.ACC computer.ACC gave  
 '(No,) Marija gave a new computer to Jelena.'
- (275) a. Who gave Jelena the new computer?  
 b. Jeleni je novi kompjuter poklonila Marija. IOVS  
 Jelena.DAT AUX new.ACC computer.ACC gave Marija.NOM  
 'Marija gave a new computer to Jelena.'
- (276) a. Is it true that Marija charged Jelena for the new computer?  
 b. (Ne,) Jeleni je novi kompjuter Marija poklonila. IOSV  
 (no,) Jelena.DAT AUX new.ACC computer.ACC Marija.NOM gave  
 '(No,) Marija gave a new computer to Jelena.'

- (277) a. Who gave Jelena a new computer?  
 b. Jeleni je poklonila novi kompjuter Marija. IVOS  
 Jelena.DAT AUX gave new.ACC computer.ACC Marija.NOM  
 'Marija gave a new computer to Jelena.'
- (278) a. What did Marija give to Jelena?  
 b. Jeleni je poklonila Marija novi kompjuter. IVSO  
 Jelena.DAT AUX gave Marija.NOM new.ACC computer.ACC  
 'Marija gave a new computer to Jelena.'
- (279) a. What happened to the new computer?  
 b. What did Marija do with the new computer?  
 c. Who did Marija give the new computer to?  
 d. Novi kompjuter je Marija poklonila Jeleni. OSVI  
 new.ACC computer.ACC AUX Marija.NOM gave Jelena.DAT  
 'Marija gave a new computer to Jelena.'
- (280) a. Did Marija sell Jelena the new computer?  
 b. (Ne.) novi kompjuter je Marija Jeleni poklonila. OSIV  
 no. new.ACC computer.ACC AUX Marija.NOM Jelena.DAT gave  
 '(No.) Marija gave a new computer to Jelena.'
- (281) a. Did Marija sell Jelena the new computer?  
 b. (Ne.) Novi kompjuter je Jeleni Marija poklonila. OISV  
 no. new.ACC computer.ACC AUX Jelena.DAT Marija.NOM gave  
 '(No.) Marija gave a new computer to Jelena.'
- (282) a. Who gave Jelena a new computer?

- b. Novi kompjuter je Jelena poklonila Marija. OIVS  
 new.ACC computer.ACC AUX Jelena.DAT gave Marija.NOM  
 'Marija gave a new computer to Jelena.'
- (283) a. Who gave a new computer to whom?  
 b. Who gave a new computer to Jelena?
- c. Novi kompjuter je poklonila Jelena Marija. OVIS  
 new.ACC computer.ACC AUX gave Jelena.DAT Marija.NOM  
 'Marija gave a new computer to Jelena.'
- (284) a. What happened to the new computer?  
 b. Who gave a new computer to whom?  
 c. Who did Marija give a new computer?
- d. Novi kompjuter je poklonila Marija Jelena. OVSI  
 new.ACC computer.ACC AUX gave Marija.NOM Jelena.DAT  
 'Marija gave a new computer to Jelena.'
- (285) a. What happened?  
 b. What did Marija give Jelena?
- c. Poklonila je Marija Jelena novi kompjuter. VSIO  
 gave AUX Marija.NOM Jelena.DAT new.ACC computer.ACC  
 'Marija gave a new computer to Jelena.'
- (286) a. Who did Marija give a new computer?  
 b. Poklonila je Marija novi kompjuter Jelena. VSOI  
 gave AUX Marija.NOM new.ACC computer.ACC Jelena.DAT  
 'Marija gave a new computer to Jelena.'

- (287) a. Who gave Jelena the new computer?  
 b. Poklonila je Jeleni novi kompjuter Marija. VIOS  
 gave AUX Jelena.DAT new.ACC computer.ACC Marija.NOM  
 'Marija gave a new computer to Jelena.'
- (288) a. What did Marija give to Jelena?  
 b. Poklonila je Jeleni Marija novi kompjuter. VISO  
 gave AUX Jelena.DAT Marija.NOM new.ACC computer.ACC  
 'Marija gave a new computer to Jelena.'
- (289) a. Who gave a new computer to whom?  
 b. Who gave a new computer to Jelena?  
 c. Poklonila je novi kompjuter Jeleni Marija. VOIS  
 gave AUX new.ACC computer.ACC Jelena.DAT Marija.NOM  
 'Marija gave a new computer to Jelena.'
- (290) a. Who gave a new computer to whom?  
 b. Poklonila je novi kompjuter Marija Jeleni. VOSI  
 gave AUX new.ACC computer.ACC Marija.NOM Jelena.DAT  
 'Marija gave a new computer to Jelena.'

## A.2 Ditransitive Predicates in Emotive Intonation Pattern

### A.2.1 O-prominent

- (291) a. What did Marija do for Jelena?  
 b. What did Marija give Jelena?

- c. Marija je poklonila novi KOMPJUTER Jeleni. SVQI  
 Mary.NOM aux gave new.ACC computer.ACC Jelena.DAT  
 'Mary gave a new computer to Jelena.'
- (292) a. What did Marija do for Jelena?  
 b. What did Marija give Jelena?
- c. Marija je novi KOMPJUTER poklonila Jeleni. SOVI  
 Mary.NOM aux new.ACC computer.ACC gave Jelena.DAT  
 'Mary gave a new computer to Jelena.'
- (293) a. What did Marija give Jelena?  
 b. Marija je novi KOMPJUTER Jeleni poklonila. SOIV  
 Mary.NOM aux new.ACC computer.ACC Jelena.DAT gave  
 'Mary gave a new computer to Jelena.'
- (294) a. What did Marija do for Jelena?  
 b. What did Marija give Jelena?
- c. Marija je Jeleni novi KOMPJUTER poklonila. SIQV  
 Mary.NOM aux Jelena.DAT new computer gave  
 'Mary gave a new computer to Jelena.'
- (295) a. What did Marija do?  
 b. What did Marija give to Jelena?
- c. Jeleni je Marija novi KOMPJUTER poklonila. ISQV  
 Jelena.DAT AUX Marija.NOM new.ACC computer.ACC gave  
 'Marija gave a new computer to Jelena.'

- (296) a. What did Marija do?  
 b. What did Marija give Jelena?  
 c. Jeleni je novi KOMPIJUTER poklonila Marija. IQVS  
 Jelena.DAT AUX new.ACC computer.ACC gave Marija.NOM  
 'Marija gave a new computer to Jelena.'
- (297) a. What did Marija give to Jelena?  
 b. Jeleni je novi KOMPIJUTER Marija poklonila. IQSV  
 Jelena.DAT AUX new.ACC computer.ACC Marija.NOM gave  
 'Marija gave a new computer to Jelena.'
- (298) a. What did Marija do?  
 b. What did Marija give Jelena?  
 c. Jeleni je poklonila novi KOMPIJUTER Marija. IVQS  
 Jelena.DAT AUX gave new.ACC computer.ACC Marija.NOM  
 'Marija gave a new computer to Jelena.'
- (299) a. What did Marija give Jelena?  
 b. Novi KOMPIJUTER je Marija poklonila Jeleni. QSVI  
 new.ACC computer.ACC AUX Marija.NOM gave Jelena.DAT  
 'Marija gave a new computer to Jelena.'
- (300) a. What did Marija give Jelena?  
 b. Novi kompjuter je Marija Jeleni poklonila. QSIV  
 new.ACC computer.ACC AUX Marija.NOM Jelena.DAT gave  
 'Marija gave a new computer to Jelena.'
- (301) a. What did Marija give Jelena?

- b. Novi KOMPJUTER je Jeleni Marija poklonila. QISV  
 new.ACC computer.ACC AUX Jelena.DAT Marija.NOM gave  
 'Marija gave a new computer to Jelena.'
- (302) a. What did Marija give Jelena?
- b. Novi KOMPJUTER je Jeleni poklonila Marija. QIVS  
 new.ACC computer.ACC AUX Jelena.DAT gave Marija.NOM  
 'Marija gave a new computer to Jelena.'
- (303) a. What did Marija give Jelena?
- b. Novi KOMPJUTER je poklonila Jeleni Marija. OVIS  
 new.ACC computer.ACC AUX gave Jelena.DAT Marija.NOM  
 'Marija gave a new computer to Jelena.'
- (304) a. What did Marija give Jelena?
- b. Novi KOMPJUTER je poklonila Marija Jeleni. QVSI  
 new.ACC computer.ACC AUX gave Marija.NOM Jelena.DAT  
 'Marija gave a new computer to Jelena.'
- (305) a. What did Marija give Jelena?
- b. Poklonila je Marija novi KOMPJUTER Jeleni. VSQI  
 gave AUX Marija.NOM new.ACC computer.ACC Jelena.DAT  
 'Marija gave a new computer to Jelena.'
- (306) a. What did Marija do?  
 b. What did Marija do for Jelena?  
 c. What did Marija give Jelena?

d. Poklonila je Jeleni novi KOMPJUTER Marija. VIOS  
 gave AUX Jelena.DAT new.ACC computer.ACC Marija.NOM  
 'Marija gave a new computer to Jelena.'

(307) a. What did Marija do?

b. What did Marija give Jelena?

c. Poklonila je novi KOMPJUTER Jeleni Marija. VOIS  
 gave AUX new.ACC computer.ACC Jelena.DAT Marija.NOM  
 'Marija gave a new computer to Jelena.'

(308) a. What did Marija do?

b. What did Marija give Jelena?

c. Poklonila je novi KOMPJUTER Marija Jeleni. VOIS  
 gave AUX new.ACC computer.ACC Marija.NOM Jelena.DAT  
 'Marija gave a new computer to Jelena.'

### A.2.2 I-prominent

(309) a. What did Marija do with the new computer?

b. Who did Marija give a new computer?

c. Marija je poklonila JELENI novi kompjuter. SVIO  
 Mary.NOM aux gave Jelena.DAT new.ACC computer.ACC  
 'Mary gave a new computer to Jelena.'

(310) a. What did Marija do with the new computer?

b. Who did Marija give a new computer?

- c. Marija je JELENI poklonila novi kompjuter. SIVO  
 Mary.NOM aux Jelena.DAT gave new.ACC computer.ACC  
 'Mary gave a new computer to Jelena.'
- (311) a. What did Marija do with the new computer?  
 b. Who did Marija give a new computer?  
 c. Marija je novi kompjuter JELENI poklonila. SOIV  
 Mary.NOM aux new.ACC computer.ACC Jelena.DAT gave  
 'Mary gave a new computer to Jelena.'
- (312) a. Who did Marija give a new computer?  
 b. Marija je JELENI novi kompjuter poklonila. SIOV  
 Mary.NOM aux Jelena.DAT new computer gave  
 'Mary gave a new computer to Jelena.'
- (313) a. Who did Marija give a new computer?  
 b. JELENI je Marija poklonila novi kompjuter. ISVO  
 Jelena.DAT AUX Marija.NOM gave new.ACC computer.ACC  
 'Marija gave a new computer to Jelena.'
- (314) a. Who did Marija give a new computer?  
 b. JELENI je Marija novi kompjuter poklonila. ISOV  
 Jelena.DAT AUX Marija.NOM new.ACC computer.ACC gave  
 'Marija gave a new computer to Jelena.'
- (315) a. Who did Marija give a new computer?  
 b. JELENI je novi kompjuter poklonila Marija. IOVS  
 Jelena.DAT AUX new.ACC computer.ACC gave Marija.NOM  
 'Marija gave a new computer to Jelena.'

- (316) a. Who did Marija give a new computer?  
 b. JELENI je novi kompjuter Marija poklonila. IOSV  
 Jelena.DAT AUX new.ACC computer.ACC Marija.NOM gave  
 'Marija gave a new computer to Jelena.'
- (317) a. What did Marija do with the new computer?  
 b. Who did Marija give a new computer?  
 c. JELENI je poklonila novi kompjuter Marija. IVOS  
 Jelena.DAT AUX gave new.ACC computer.ACC Marija.NOM  
 'Marija gave a new computer to Jelena.'
- (318) a. What did Marija do with the new computer?  
 b. Who did Marija give a new computer?  
 c. JELENI je poklonila Marija novi kompjuter. IVSO  
 Jelena.DAT AUX gave Marija.NOM new.ACC computer.ACC  
 'Marija gave a new computer to Jelena.'
- (319) a. What did Marija do with the new computer?  
 b. Who did Marija give a new computer?  
 c. Novi kompjuter je Marija JELENI poklonila. OSIV  
 new.ACC computer.ACC AUX Marija.NOM Jelena.DAT gave  
 'Marija gave a new computer to Jelena.'
- (320) a. Who did Marija give a new computer?  
 b. Novi kompjuter je JELENI Marija poklonila. OISV  
 new.ACC computer.ACC AUX Jelena.DAT Marija.NOM gave  
 'Marija gave a new computer to Jelena.'

- (321) a. What did Marija do with the new computer?  
 b. Who did Marija give a new computer?  
 c. Novi kompjuter je JELENI poklonila Marija. OIVS  
 new.ACC computer.ACC AUX Jelena.DAT gave Marija.NOM  
 'Marija gave a new computer to Jelena.'
- (322) a. What did Marija do with the new computer?  
 b. Who did Marija give a new computer?  
 c. Novi kompjuter je poklonila JELENI Marija. OVIS  
 new.ACC computer.ACC AUX gave Jelena.DAT Marija.NOM  
 'Marija gave a new computer to Jelena.'
- (323) a. Who did Marija give a new computer?  
 b. Poklonila je Marija JELENI novi kompjuter. VSIO  
 gave AUX Marija.NOM Jelena.DAT new.ACC computer.ACC  
 'Marija gave a new computer to Jelena.'
- (324) a. What did Marija do with the new computer?  
 b. Who did Marija give a new computer?  
 c. Poklonila je JELENI novi kompjuter Marija. VISO  
 gave AUX Jelena.DAT new.ACC computer.ACC Marija.NOM  
 'Marija gave a new computer to Jelena.'
- (325) a. What did Marija do with the new computer?  
 b. Who did Marija give a new computer?  
 c. Poklonila je JELENI Marija novi kompjuter. VISO  
 gave AUX Jelena.DAT Marija.NOM new.ACC computer.ACC  
 'Marija gave a new computer to Jelena.'

(326) a. Who did Marija give a new computer?

b. Poklonila je novi kompjuter JELENI Marija. VOIS

gave AUX new.ACC computer.ACC Jelena.DAT Marija.NOM

'Marija gave a new computer to Jelena.'

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