

Branimir Stanković, Aleksandra Janić

SINFONIJA 6 PROCEEDINGS

Papers from the 6<sup>th</sup> conference *Syntax, Phonology and Language Analysis*  
(*SinFonIJA 6*), held at the Faculty of Philosophy of University in Niš, Serbia,  
September 26–28, 2013

Library  
SCIENTIFIC CONFERENCES

Editors

Branimir Stanković  
Aleksandra Janić

Editor in Chief

Gordana Đigić

Academic Board

Boban Arsenijević, Faculty of Philosophy, Niš, Serbia  
Goran Maksimović, Faculty of Philosophy, Niš, Serbia  
Nadežda Jović, Faculty of Philosophy, Niš, Serbia  
Rajesh Bhatt, University of Massachusetts, Amherst, USA  
Daniel Buring, University of Vienna, Austria  
Balazs Suranyi, Hungarian Academy of Sciences, Hungary  
Nino Grillo, New University of Lisbon, Portugal  
Rok Žaucer, University of Nova Gorica, Slovenia  
Tanja Samardžić, Faculty of Filology, Belgrade, Serbia  
Sabina Halupka-Rešetar, Faculty of Philosophy, Novi Sad, Serbia  
Aleksandra Janić, Faculty of Philosophy, Niš, Serbia  
Branimir Stanković, Faculty of Philosophy, Niš, Serbia

Secretary

Aleksandra Janić

Reviewers

Prof. Boban Arsenijević  
Prof. Iliana Krapova  
Prof. Andrew Nevins

University of Niš  
Faculty of Philosophy

# SinFonJA 6 Proceedings

The 6<sup>th</sup> International Conference *Syntax, Phonology and Language Analysis (SinFonJA 6)*, held at the Faculty of Philosophy of University in Niš, Serbia, September 26–28, 2013

Editors

Branimir Stanković

Aleksandra Janić

Faculty of Philosophy in Niš

Niš, 2019

## CONTENTS

### SINFONIJA 6 PROCEEDINGS

Branimir Stanković, Aleksandra Janić	
INTRODUCTION AND ACKNOWLEDGEMENTS .....	7
Sabina Halupka-Rešetar	
LEFT PERIPHERAL MATTERS IN SERBIAN: THE ROLE OF DISCOURSE-PRAGMATICS IN WORD ORDER VARIATION AND HOW TO MOTIVATE IT .....	9
Franc Marušič, Rok Žaucer	
ON THE NATURE OF PRENUMERAL ADJECTIVES .....	39
Petra Mišmaš	
DPs, IPs AND (MULTIPLE) <i>WH</i> -FRONTING .....	63
Branimir Stanković	
DP OR NP? THE CASE OF SERBIAN SOUTHEASTERN DIALECTS AND MACEDONIAN LANGUAGE .....	83
Esra Predolac	
BARE CPs AND NPs IN TURKISH .....	119
Veronika Szabó, Judit Farkas, Gábor Alberti, Mónika Dóla	
DP-INTERNAL OPERATORS AND THEIR SCOPAL INTERACTION WITH OPERATORS OF THE VERB .....	141
Neda Todorović	
ASPECTUAL ASYMMETRIES AND THE LACK OF TP IN SERBIAN .	161

Remus Gergel, Daniel Ferguson	
'DONE GONE': ON EXPRESSIVITY IN THE PERFECT IN AFRICAN AMERICAN ENGLISH .....	177
Mirjana Mirić	
FOCUS-AFFECTED (UN)AVAILABILITY OF SCALAR IMPLICATURES .....	197
Marko Simonović, Antonio Baroni	
LEXICON, MARKEDNESS AND GRAMMAR IN THE SERBOCROATIAN WOBBLY A .....	217

Mirjana Mirić<sup>75</sup>  
University of Niš

## FOCUS-AFFECTED (UN)AVAILABILITY OF SCALAR IMPLICATURES

**Abstract:** This paper investigates the role of contrastive focus in the process of generating scalar implicatures (SIs) in the interpretation of sentences with the quantifier *neki* ‘some’ in Serbian. The role of focus has been neglected in the previous research, since most studies insisted on using ‘neutral’ stimuli in experiments on SIs. We hypothesize that the proportional reading of the quantifier, and the scalar implicature, should be facilitated if the proper scalar alternatives are evoked. One strategy to achieve this is to focalize the quantifier, given that focus is a device for evoking alternatives (Rooth 1985, Herburger 2000) – a mechanism characteristic of generating SIs as well (Barner & Bachrach 2010). In order to test this prediction we performed a series of experiments based on the Truth Value Judgment Task. Adult Serbian speakers (n=27) performed a visual version of the experiment, but we also present preliminary results from our work-in-progress with 7-year old (n=30) and 9-year old children (n=30) who conducted an audio version of experiments. The results suggest that focus does affect the availability of SIs, given that both adults and children tend to interpret the quantifier *neki* ‘some’ proportionally when it bears contrastive focus (although certain constraints such as partitivity affect the role of focus in adults).

**Key words:** *contrastive focus, experimental pragmatics, scalar implicatures, Serbian, quantifier neki ‘some’.*

### 1. Introduction

Most empirical studies in the domain of scalar implicatures (henceforth SIs) were focused on the developmental perspective, showing that children are not as capable of generating SIs as adults are: adult participants derive SIs at a rate of more than 80%, while children remain at a chance level or lower (Barner, Brooks & Bale 2010, Gualmini et al. 2001, Papafragou & Musolino 2003, Noveck 2001, among others). However, recent findings indicate that in the contexts where the

---

<sup>75</sup> mandic.mirjana@gmail.com

experimental paradigm is as neutral as possible and all the contextual factors are factored out, rates of scalar inferences are below 50%, on average, and never higher than 65% even in the adult speakers (Geurts 2010). These facts have also been attested in several studies dealing with Serbian quantifiers, which show that Serbian adult speakers often interpret the scalar term *neki* ‘some’ logically, not generating the implicatures (Katsos, Anđelković, Savić, Jošić 2009, Katsos et al. 2012, Mirić, Arsenijević 2013a, Mirić, Arsenijević 2013b). This additionally draws attention to the potential language variation and variation among adults.

Since the general pragmatic capacity should not be subject to language variation, our hypothesis is that aspects of syntax, semantics, prosody or information structure are responsible for the failure of adult Serbian speakers to derive SIs. Departing from here, we investigated different linguistic factors affecting the availability of SIs. This paper reports on the role of contrastive focus.

Focusing on the interpretation of utterances containing the scalar term *neki* ‘some’ in Serbian, this study is concerned with testing the hypothesis that contrastive focus plays an important role in making the scalar alternatives of quantifiers more available in the discourse, thus enabling the derivation of a scalar implicature.

The paper is structured as follows. In Section 1 we briefly describe what is known about scalar implicatures and contrastive focus, and review previous empirical studies. A brief description of the Serbian quantifier *neki* ‘some’ is also provided. In Section 2 we present the methodology used in the study – the Truth Value Judgment Task performed by Serbian native speakers. Results are presented in Section 3. First we present the results obtained from the population of adult speakers who performed a visual version of the experiment, and then the results of the audio experiments in progress obtained from 7- and 9-year old children. Both types of the experiments show that contrastive focus significantly affects the derivation of scalar implicatures in the given context. We discuss the implications of these results for theories of scalar implicatures and emphasize several methodological issues in Section 4. Finally, in Section 5 we conclude that different contextual cues available in the context make scalar implicatures more or less available to participants.

### **1.1. Scalar implicatures**

Let us first briefly review theoretical background of the notion of scalar implicatures. Consider the dialogue in (1).

- (1) A: Was the party good?  
B: Some (of the) people left early.  
→ Not all (of the) people left early.

B's utterance can have either a lower-bound, semantic interpretation of the quantifier *some* (at least one person left early) or an upper-bound, pragmatic interpretation (some, but not all of the people left early). This pragmatic enrichment from the semantic to the pragmatic interpretation has usually considered to be a scalar implicature. Scalar implicatures are not inherent part of the semantic meaning of words, i.e. the truth-conditional content carried by a sentence. SIs are pragmatic inferences which interlocutors derive based on the information from the context or background knowledge. SIs, as well as other conversational implicatures, arise on the assumption that discourse is a joint project undertaken by speakers who expect each other to be cooperative and follow the conversational maxims (Grice 1989). In that sense, B's utterance triggers another implicature, not scalar in its nature – that party was not good, given that some people left early.

In this paper we are dealing with scalar implicatures, which arise in virtue of speakers using a weaker scalar alternative from a contextually given informational scale (Horn 1972, 2006). In the case of *some*, the relevant scale includes other quantifiers <some, many, most, all>. It is the standard assumption that *some* and *all* stand in a special relationship such that one of them is uttered, the other is automatically activated as an alternative (Sauerland 2012). Scales are used to generate sets of alternative meanings, which are ordered according to their informativeness and are implicitly contrasted during interpretation. Informativeness is defined in terms of entailment: stronger scalemates (*all*) entail weaker ones (*some*), but the opposite doesn't hold. The assertion of a weaker term (*some*) conversationally implies the negation of the stronger ones (*not all*).

Computing a scalar implicature involves the following steps (see Barner & Bachrach 2010 for a more formal and detailed elaboration):

- 1) Computing a literal meaning of an utterance:  
*At least some people* left the party early.
- 2) Generating relevant alternative utterances:  
*All* people left the party early.



- 3) Inferring that a speaker was not in a position to utter the stronger alternatives (Grice's Maxim of Quantity)
- 4) Negating the stronger alternatives, i.e. deriving the scalar implicatures:

*Some, but not all* people left the party early.

With regard to the theoretical approaches dealing with the nature of scalar expressions, there is an ongoing debate between two equally influential accounts. Within the defaultist account, characteristic of certain neo-Gricean approaches (Levinson 2000, Chierchia 2004, Horn 2006), scalar implicature 'some, but not all' in the upper-bound interpretation of the quantifier *some* is the part of the meaning of the quantifier, it is generated automatically and by default. Within the contextualist view, scalar implicatures are generated only in contexts in which they are relevant and triggered by particular contextual factors (Geurts 2010, Breheny, Katsos & Williams 2006, Wilson and Sperber 1995). The main difference between the two accounts is the question whether the pragmatic, scalar reading is immediately available to speakers or needs to be strengthened in the context. Having this in mind, the quantifier *neki* 'some' in Serbian appears to be very interesting for research because of its specific property in this domain.

### **1.2. The word *neki* 'some' in Serbian**

The type of an utterance that we have used as stimuli in our experiments *Neke bojice su u pernici* 'Some (of the) crayons are in (the) pencil-case', can have either a cardinal (weak) reading – an undetermined number of crayons is in the pencil-case, or a proportional (strong) reading – given a set of crayons, some members of this set (and not others) are in the pencil-case (Milsark 1977). Cardinal interpretation gives rise to indefinite reading of *some* – at least some crayons are in the pencil-case, whereas proportional interpretation gives rise to a scalar implicature – some, but not all crayons are in the pencil-case.

Due to the lack of articles in Serbian, the interpretation of bare nouns is ambiguous. The word *neki* 'some' can precede a noun to serve a function of an indefinite article (both singular and plural nouns), and it can also cover the quantifier meaning (with plural nouns). The indefinite reading of *neki* 'some' is the dominant or default one, which makes the scalar interpretation the marked one. Therefore, it seems that Serbian speakers need to put more effort in deriving the scalar inference, given that they must go beyond the dominant default interpretation.

### 1.3. Previous studies of scalar implicatures

As noted in the Introduction, in order to point out pragmatic or cognitive limitations in children, most studies investigated SIs from a developmental point of view, using adult speakers only as control groups. However, there are studies which suggest both language variation as well as extralinguistically driven variation among adult population. A major study reports on lower percentage of implicatures in adult speakers of certain languages, Serbian being among them. According to the results of the COST Action A33 project (Katsos, Anđelković, Savić, Jošić 2009, Katsos et al. 2012), which investigated the acquisition of various quantifiers in 24 different languages, only 54% of Serbian adult speakers derived implicatures (in comparison to 99% of English speakers). This suggests that certain syntactic and semantic properties might be responsible for the low percentage of scalar inferences in Serbian and some other languages. One such property – partitivity – has already been shown to affect the rates of SIs in adult speakers of Serbian (Mirić, Arsenijević 2014). In addition, there are other, extralinguistic factors that influence the ability of adult speakers to derive SIs, such as speakers' educational background (Mirić, Arsenijević 2013b). Having all this in mind, scalar implicatures become even more promising research area from an interdisciplinary perspective, not just from the point of view of developmental psycholinguistics.

It is noteworthy that throughout the developmental studies various methodological problems can be observed, the use of the so-called 'neutral' stimuli being one of them. The experiments were usually based on the audio recorded utterances in which none of the words bears intonational (contrastive) focus, i.e. all words are produced 'as neutrally as possible'. This methodological choice seems rather impossible to achieve, unless sentences are read by the computer, as well as unnatural for interlocutors – focus is necessary in order to convey or perceive a meaningful message.

In our study we tested the prediction that focus might affect the scalar implicatures given that both the process of deriving SIs and the process of focalization involve the same mechanism of generating the alternatives and rejecting the ones which are not informative enough in the context. We hypothesize that the contrastive focus on the quantifier should make the scalar inference more available because it raises the relevance of a set of alternatives for the given quantifier. This hypothesis is in line with predictions already made in the literature, e.g. Geurts 2010 claims that contrastive focus could make SIs more available in the context. In addition,

previous empirical data dealing with focus conform to this assumption (Chevallier et al. 2008, Schwarz, Clifton & Frazier 2008, Zondervan 2010).

#### **1.4. Contrastive focus**

Different languages use various phonological and syntactic means to express focus (see Krifka 2008 for a more detailed elaboration on the focus types). This paper deals with the notion of contrastive focus. A focused expression is an expression which in a spoken language has an accentual peak or stress which is used to contrast or to compare the contrasted item either explicitly or implicitly with a set of alternatives (Hoeksema & Zwarts 1991). It represents an emphasized part of an utterance which indicates the presence of a set of alternatives relevant for the interpretation of the utterance (Rooth 1985, Hendriks 2004, Krifka 2008). It is expected that the alternatives which are not informative in the given context should be rejected.

Although the role of focus with regard to SIs is discussed earlier (Hirschberg 1985, Rooth 1992, von Stechow 1994), it has been only recently pointed out by Geurts (2010) that the focus should be tested as a means to evoke alternatives, which then triggers the SI. An important theoretical work that discusses the importance of focus for SIs derivation is presented in Hirschberg 1985: the author describes the marking of focus (by syntactic or intonational means) as ways to express *salience*, which is responsible for triggering the SI. Several papers discussed the effect of focus in the quantificational interpretation of scalar expressions such as *some* (Partee 1991, Herburger 1997). However, most of the studies concentrated on the effect of focus-sensitive particles such as *even*, *only* or *always* (Beaver & Clark 2003, Gotzner et al. 2013, Spalek, Gotzner & Wartenburger 2014) investigating the interpretation of nouns under the scope of a quantifier. Only few studies actually dealt with the focalization of the scalar expressions, mainly with the disjunction *or* (which forms a scale <and, or>) and we will only briefly summarize their main findings.

The study of Chevallier et al. (2008) tested the effect of focus in the process of SIs derivation in the interpretation of the utterances containing the disjunction *or* in English. Their study showed that the percentage of successfully derived SIs increased in comparison to neutral stimuli when the disjunction *or* was emphasized in a sentence (increased for 23% in a written form – when *or* was underlined and marked by capital letters, and for 50% in the spoken form in which participants heard the intonationally marked disjunction). The authors predicted this effect

from a relevance theoretic account, in which there is a pay-off between effort and effect. Focusing *or* motivates the hearer to make a bigger effort in interpreting the sentence. Therefore, the effect should also be bigger and it is more likely the hearer will go beyond the literal meaning of the sentence and enrich the meaning by deriving the SI.

Another study examined the effect of stress on *or* in English (Schwarz, Clifton & Frazier 2008), although from a different viewpoint. In their Experiment 1 the percentage of derived SIs was 84% when *or* was emphasized in the sentence, and 71% when another part of the sentence was accented (in their case – the auxiliary). In addition, the reaction time was significantly longer when the stress was on the auxiliary than on the disjunction. They claimed that emphasizing a scalar term increases SI-rates because it activates the scale. By activating the scale, the contrast between the term used and its alternatives is highlighted.

In a series of experiments, Zondervan (2010) investigated the effects of informational focus on scalar implicatures in the process of interpreting the disjunction *or* in Dutch. In his Experiment 3, stress on the spoken stimuli indicated which part of the sentence was informational focus. The percentage of derived SIs was 85% for the focused and 55% for the non-focused disjunction *or*, indicating the effect of focus.

All of the above mentioned studies focused on the interpretation of disjunction *or*, and to our knowledge, the role of contrastive focus in the interpretation of quantifiers has not been attested so far, although it deserves an equal attention.

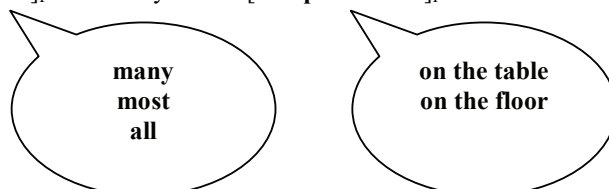
### 1.5. Hypothesis

Given that most of the previous studies in the domain of SIs based their findings on the ‘neutral’ stimuli, i.e. sentences in which none of the words was focalized, we assume that there is a vast area of implications that are not taken into account when discussing the process of deriving SIs.

We assume that the scalar implicature of the quantifier *neki* ‘some’ in Serbian fails due to the failure in evoking the relevant set of alternatives for the quantifier and establishing the proper reference domain restriction for the noun phrase. Following Schwarz, Clifton & Frazier (2008), we hypothesize that focusing a scalar item increases a listener or reader’s tendency to compute a scalar implicature, given that focus draws attention to the speaker’s use of a particular term on a scale and thus

activates the scale itself. In particular, the scalar implicature should be facilitated if the quantifier itself is contrastively focalized (stressed in a sentence). By focusing the quantifier the relevant set of scalar alternatives should be generated (*many*, *most*, *all*), whereas focusing another part of a sentence (such as the predicate) should trigger the alternatives for that part of a sentence, making the scalar alternatives less relevant in the given context (cf. example 2).

2) [**Some**]<sub>F</sub> of the crayons are [**in a pencil-case**]<sub>F</sub>.



## 2. Methods

### 2.1. Material and procedure

In order to test our prediction we used a variation of the Truth-value judgment task (TVJT). Participants were shown a set of visual stimuli (e.g. five crayons in a pencil-case), followed by a sentence containing the quantifier *neki* 'some' (e.g. *Neke bojice su u pernici*. 'Some of the crayons are in a pencil-case'). They were asked to evaluate whether the utterance corresponds to a visually presented situation. In Experiment 1, the sentences were presented in a written form, on the screen, whereas in Experiment 2 participants were listening to prerecorded sentences.

The participants were introduced to a character named Pera. They were informed that he could not see well, so they would have to help him in the joined activity of looking at the pictures. The participants were told that Pera would state things about the pictures and that they were to say whether Pera gave appropriate comments about what he saw in the pictures. Preceding each picture, a sentence was introduced in order to provide an appropriate context (a larger set of crayons): *We brought 5 crayons to school*. The main question for the participants was: *Did Pera see it well?* and they were asked to click on a 'yes' or 'no' button shown on the screen (Experiment 1) or to answer 'yes' or 'no' (Experiment 2). In the audio

version of the experiment, if the answer was ‘no’, participants had to elaborate their answer.

The main phase of the experiment was preceded by a training phase (ten warm-up sentences) which aimed at making participants familiar with the task. In the main part of the experiment, participants were shown a set of eight target items, eight control items and four filler sentences (see Appendix for examples). Each target item satisfied the truth conditions of an informationally stronger element (*all*) within a quantifier scale but was described by Pera in terms of a weaker element (*some*). For instance, the target item ‘Some of the crayons are in a pencil-case’ was used in a situation where in fact all of the crayons were in the pencil-case. Control items involved fully appropriate uses of *neki* ‘some’ (e.g. when 3 out of 5 objects were on the table) or the ones in which it yielded a false description (e.g. when none of the objects was on the table). In order to balance the ratio of the yes/no responses, we also included 4 filler sentences (the quantifier being replaced by an adjective). The target items, control items and filler sentences were administered in a pseudo-random order.

## 2.2. Participants

*Experiment 1:* The participants were 27 monolingual Serbian-speaking adults (mean age = 24). They were mainly students recruited from the University of Belgrade. They all performed a visual version of the experiment (made as a Google Docs Questionnaire) which they accessed from their own computers.

*Experiment 2:* The participants were 30 7-year-old and 30 9-year-old monolingual Serbian-speaking children. They were recruited from a primary school in Belgrade. They all performed an audio version of the experiment.

None of the participants reported any vision or hearing difficulties.

## 2.3. Variables

Two conditions were tested in the experiment: the contrastive focus condition was tested as a between-subjects factor, with participants being randomly assigned to one of the conditions.

Contrastive focus had 3 levels: focus on the quantifier, on the predicate phrase, and neutral focus, as in (3). In the visual version of the experiment, the contrastive

focus was marked by capital letters, whereas in the audio version target words were intonationally focalized.

- (3) a. NEKE od bojica su u pernici.  
b. Neke od bojica su U PERNICI.  
c. Neke od bojica su u pernici.  
'Some of the crayons are in a pecil-case'

We have also controlled for the partitivity condition as a within-subject factor with 2 levels: non-partitive construction (*neke bojice* 'some crayons') and partitive construction (*neke od bojica* 'some of the crayons').

In Experiment 2, we additionally tested the age condition, as a between-subject factor with two levels: 7-year-olds and 9-year-olds.

In the test trials, where the use of the quantifier *svi* 'all' was more informative for the given situations, we expected the participants to reject the sentence based on a scalar inference (answers of the type: *No, he didn't see well, because all of the crayons are in the pencil-case*). Thus, a dependent measure was the percentage of rejected sentences used in the 'all'-contexts.

### 3. Results

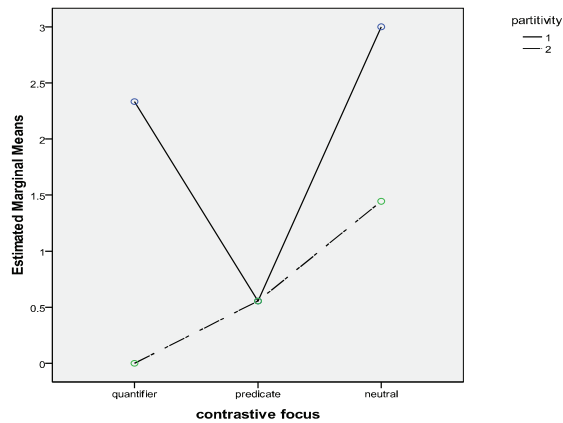
#### *Experiment 1 (Visual experiments with adults)*

General Linear Model Repeated Measures ANOVA test statistics were run on the response percentages with contrastive focus as a between-subjects factor and partitivity as a within-subjects factor. The analysis revealed:

- main effect of focus ( $F=3.812$ ;  $df=2$ ;  $p<0.05$ ), showing that adult participants derived scalar implicatures at a higher rate when the focus was neutral or placed on the quantifier, whereas the focus on the predicate phrase inhibited scalar implicatures;
- main effect of partitivity ( $F=18.081$ ;  $df=1$ ;  $p<0.05$ ), showing that partitive construction gave rise to more scalar implicatures than the non-partitive one;
- reliable interaction of focus and partitivity ( $F=5.063$ ;  $df=2$ ;  $p<0.05$ ), showing that the neutral focus or the focus on the quantifier had more

effect when the partitive construction was used, whereas the non-partitive construction blocked the scalar interpretation.

Scheffe post-hoc test revealed that the difference between the stimuli was mainly carried out by the difference between the neutral focus and the focus on the predicate ( $p=0.039$ ).



**Figure 1:** The effect of focus and partitivity on scalar implicatures (adults)

The overall percentage of derived SIs is given in Table 1. We calculated the percentage of SIs based on the overall number of rejected target utterances with regard to the overall number of target stimuli per condition.<sup>76</sup>

<sup>76</sup> It is worth mentioning that there are two methods of calculating the number/percentage of derived scalar implicatures, although in the literature we rarely find explicit elaboration of the method being used. We assume the choice of a method might affect different results among studies. The first method includes calculating the number of participants who reject target utterances, indicating in the results that a given number of participants derives SIs. Following Pouscoulous et al. 2007 who investigated the role of partitivity in deriving scalar inferences, we have used this method in our paper on how partitivity affects availability of SIs (Mirić, Arsenijević 2014). However, we think that this method is not quite precise because a participant could be considered as being able to derive the implicature if (s)he rejected all of the target utterances or only a certain proportion of them – and this proportion may vary among different experiments and papers. The second method includes calculating the number/percentage of rejected utterances with regard to the overall number of target stimuli per condition, and this method has been used in this paper. Besides avoiding the arbitrariness, this method better suits the statistical data we have provided based on the ANOVA analysis.

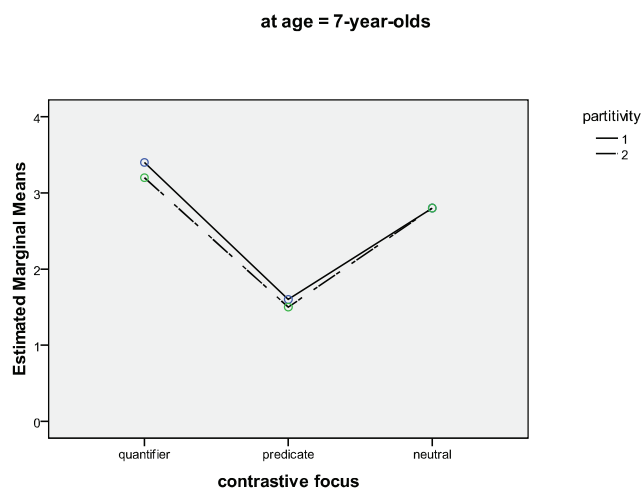


focus	quantifier		predicate		neutral		overall	
	part	non-part	part	non-part	part	non-part	part	non-part
<b>SIs %</b>	58,3 %	0%	13,9%	13,9%	75%	36,1%	49%	16,7%

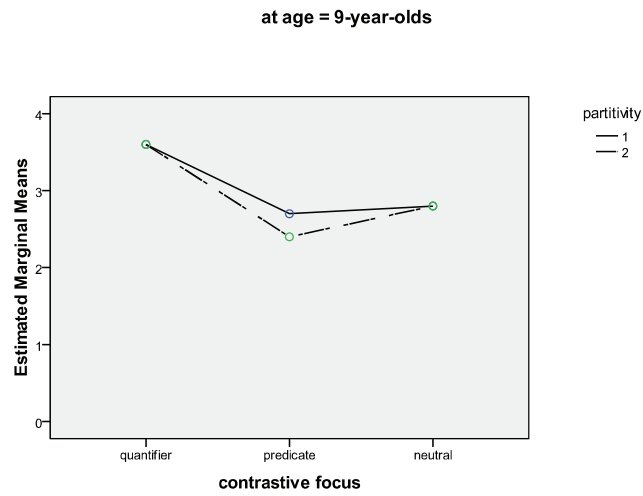
**Table 1:** The percentage of derived scalar implicatures with regard to focus and partitivity

*Experiment 2 (Audio experiments in progress: children)*

General Linear Model Repeated Measures ANOVA test statistics were run on the response percentages with contrastive focus and age as between-subjects factors and partitivity as a within-subjects factor. The analysis revealed a main effect of focus ( $F=3.220$ ;  $df=2$ ;  $p<0.05$ ), showing that 7- and 9-year-old children derived scalar implicatures at a higher rate when the focus was placed on the quantifier. In addition, Scheffe post-hoc test revealed that the difference between the stimuli was mainly carried out by the difference between the focus on the quantifier and the focus on the predicate ( $p=0.048$ ). However, there were no effects of partitivity nor age, nor any interactions between the conditions.



**Figure 2:** The effect of focus and partitivity on scalar implicatures (7-year-olds)



**Figure 3:** The effect of focus and partitivity on scalar implicatures (9-year-olds)

The overall percentage of derived scalar implicatures with regard to age is given in Table 2. We calculated the percentage of SIs based on the overall number of rejected target utterances with regard to the overall number of target stimuli per condition.

focus	quantifier		predicate		neutral		overall	
	part	non-part	part	non-part	part	non-part	part	non-part
<b>7-y-o SIs %</b>	85%	80%	40%	37.5%	70%	70%	65%	62,5%
<b>9-y-o SIs %</b>	90%	90%	67.5%	60%	70%	70%	75,8%	73,3%

**Table 2:** The percentage of derived scalar implicatures with regard to focus and partitivity

#### **4. Discussion**

This paper reports on two experiments manipulating the contrastive focus in sentences which trigger scalar implicature. In Experiment 1 adult speakers of Serbian read sentences, whereas in Experiment 2 7- and 9-year-old children listened to prerecorded sentences. Our results show that contrastive focus affects the availability of scalar implicature: a sentence with the quantifier *neki* ‘some’ is more likely to give rise to a scalar implicature when the quantifier is focalized than when the focus is on the predicate phrase. Additionally, neutral focus also gives rise to more implicatures, indicating that in the given context, the relevant set of alternatives is generated for the quantifier expression, not the predicate phrase.

In Experiment 1 the highest SI-rates are obtained for the neutral focus (75% when the partitive construction was used), showing that scalar alternatives are more available to adult speakers of Serbian when they read a sentence without any marked focus on the words, allowing them to distribute focus on their own. One could think that this finding justifies the previous experimental designs which used only neutral stimuli, since it triggers the SIs at the highest rates. However, we think that this should not be the case, given that the analysis showed significant difference between other two focus positions: participants more often assigned strong interpretation to the quantifier when the quantifier itself was marked in comparison to the focalized predicate, although it is worth mentioning that the partitive construction significantly supported the scalar interpretation of the quantifier (cf. 58% for the partitive and 0% for the non-partitive when the quantifier was focalized).

In Experiment 2, scalar alternatives were also highly available to children when neutral focus was used (70% for both partitive and non-partitive construction in both age groups), although the highest rate of SIs was achieved when the quantifier was focalized (above 80% for both age groups). This finding strongly indicates that contrastive focus on the quantifier affects the availability of scalar inferences in the audio version of the experiments. Although the experiments with children are still in progress, we can say that the absence of developmental difference between the ages of 7 and 9 conform to the previous findings that starting from the age of 7 children are successful at deriving scalar implicatures (Gualmini et al. 2001, Papafragou et al. 2003), although other authors report on the lack of the ability to compute the inferences at the ages of 7 (Noveck 2001) or even 9 (Chierchia et al. 2001). However, in order for us to fully understand our data and investigate the

potential effects of age, other ages – children at the age of 5 and adult speakers – should participate in the same version of the experiment. Based on our findings we can only state that children at the age of 7 and 9 have the pragmatic capacity to derive scalar implicatures and they are sensitive to contrastive focus in the process of derivation.

It is important to note that, as post-hoc Scheffé test showed for both adults and children, focus on the predicate significantly blocked the scale of quantifier alternatives. As we predicted, the focalized predicate was part of the sentence for which the alternatives were generated, thus making the quantifier alternatives less available. In addition, in Experiment 1 the otherwise significant partitivity effect was blocked when the predicate was focalized.

These findings go in line with the assumption that a focalized word draws more attention and triggers its own set of alternatives. When the quantifier is focalized, its scalemates become more prominent in the context, which enables the participants to contrast them and infer that the stronger one does not hold (accessing the scalar implicature). On the other hand, the focus on the predicate phrase triggers its own set of alternatives, which makes the quantifier set of alternatives less relevant. These results provide empirical support for the contextualist account of scalar implicatures, adding contrastive focus to the list of contextual factors that influence the process of deriving SIs.

It is noteworthy that Serbian adult speakers derive scalar implicatures at a lower rates than previous studies reported for other languages. This overall low percentage of SIs might indicate the dominance of logical interpretation of the quantifier *neki* ‘some’ in Serbian, so cardinal (weak) interpretation is shown to be the default one, at least when a sentence is in a written form. This finding would go against the predictions of the defaultist accounts, showing that SIs are not generated by default and automatically and calls into question what Degen calls the Frequency Assumption (Degen 2013) – a previous claim that scalar inferences are regular and frequent (cf. Levinson 2000, Breheny, Katsos & Williams 2006 among others). Nevertheless, bearing in mind children’s high performance, we assume that experimental design could have contributed to the lower rates of SIs in adults. This brings us to the very important methodological issue regarding our as well as previous developmental experiments. First of all, we think that the results obtained for adult speakers in Experiment 1 and the ones for children in Experiment 2 are not comparable, given that they participated in different modalities of experiment, namely – reading and listening to the sentences. Although other studies (Chevallier

et al. 2008, Schwarz, Clifton & Frazier 2008, Zondervan 2010) reported the difference in SI-rates with respect to modalities, showing that the spoken sentences gave rise to more SIs than the written ones, in our experimental design the comparison might cause a potential confound, because there are different age groups in the two experiments. Therefore, it is necessary to complete experiments with different age groups in order to compare the two modalities. Other developmental studies often combine these two modalities (see Papafragou & Musolino 2003, Katsos et al. 2012, among others), giving the adults to read the task and provide written answers, whereas children listen to the sentences. However, bearing in mind the difference between written and spoken stimuli obtained with regard to the contrastive focus, we think that in future studies adults should also follow the same experimental procedure as children. Our findings also suggest that the role of modalities (visual vs. audio) might be fruitful area of investigation of SI derivation and sentence interpretation in general.

Finally, we would like to emphasize several advantages of audio experiments that arise with respect to the role of contrastive focus on SIs. The most obvious is the fact that generally in spoken language at least one word usually bears contrastive focus in a sentence, whereas in a written form words are rarely put in capital letters. This is why the results obtained using the audio material are more indicative of the role that contrastive focus has. In addition, in the audio version of the experiment, participants have the opportunity and more time to elaborate their answers, which could give us a qualitative insight in their doubts and dilemmas which are usually not available to researchers when analyzing written answers. Participants spontaneously gave explanations of their answers or the situations in the pictures they observed, which could help researchers to interpret the data and improve the methodology.

## **5. Conclusion**

This study reports on how contrastive focus affects the availability of scalar inferences. We showed that scalar implicatures are more likely to be computed when the focus is on the quantifier or neutral than when it is on the predicate. This finding shows us that: a) contrastive focus enables participants to generate relevant set of alternatives, which in the case of the quantifier alternatives results in scalar interpretation, b) in most of the cases, sentences with neutral focus are actually interpreted as having the focalized quantifier. Nevertheless, given that the percentages of SIs vary, we can say that the role of focus is not absolute, as already noted by Chevallier et al (2008): the focus makes the scalar interpretation more

available, although not necessary. Focus simply makes the alternatives more salient in the context, making the scalar implicature more available.

Our results conform to recent findings that the strength of SIs is probabilistically modulated by multiple contextual clues (Degen, Gunlogson, Tanenhaus 2013). This corpus and web-based study showed that scalar inferences from *some* to *not all* are far less frequent than commonly assumed, and implicature strength is correlated with overt partitivity, quantifier strength and discourse accessibility. Our study brings contrastive focus to the list of contextual factors that affect scalar interpretation of the quantifiers.

### Acknowledgments

This paper has highly benefited from discussions with my supervisor Boban Arsenijević (University of Niš). I further wish to thank SINFONIJA 6 audience for the fruitful discussion. I am grateful to Darinka Anđelković, Maja Savić and Oliver Tošković (Laboratory of Experimental Psychology, Belgrade) for their generous input in designing the experiments, Ana Batas and Jovan Čudomirović (Faculty of Philology, Belgrade) for their help in making the audio material, as well as Tihana Smiljanić, Snežana Todorović and Lazar Bojčić (Petnica Science Center) for their help in conducting the visual experiment. Many thanks to all the participants, especially to children and teachers from Branko Radičević school in Batajnica. All the mistakes are of my own.

### References

- Barner, D., N. Brooks, A. Bale. 2010. Quantity implicatures and access to scalar alternatives in language acquisition. In *Proceedings of Semantics and Linguistic Theory 20*, 525–543.
- Barner, D., A. Bachrach. 2010. Inference and exact numerical representation in early language development. *Cognitive Psychology* 60 (1): 40–62.
- Beaver, D., B. Clark. 2003. Always and Only: Why not all focus-sensitive operators are alike. *Natural Language Semantics* 11: 323–362.
- Breheny, R., N. Katsos, J. Williams. 2006. Are Generalized Scalar Implicatures Generated by Default? An On-line Investigation into the Role of Context in Generating Pragmatic Inferences. *Cognition* 100: 434–463.
- Chevallier, C. et al. 2008. Making disjunctions exclusive. *The quarterly journal of experimental*

*psychology* 61: 1741–1760.

Chierchia, G. et al. 2001. The acquisition of disjunction: evidence for a grammatical view of scalar implicatures. In *Boston University Conference on Language Development 25*, 157–168. Somerville, MA: Cascadilla Press.

Chierchia, G. 2004. Scalar Implicatures, Polarity Phenomena and the Syntax/Pragmatics Interface. In *Structures and Beyond*, A. Belletti (ed.), 39–103. Oxford University Press.

Degen, J. 2013. *Alternatives in Pragmatic Reasoning*. PhD thesis. University of Rochester, New York.

Degen, J., C. Gunlogson, M. Tanenhaus. 2013. *Frequency and distribution of some (but not all)*

*implicatures*. XPRAG (The 5th Biennial Conference of Experimental Pragmatics) 2013, Utrecht, Netherlands.

von Fintel, K. 1994. *Restrictions on quantifier domains*. PhD thesis. University of Massachusetts, Amherst.

Geurts, B. 2010. *Quantity implicatures*. Cambridge: Cambridge University Press.

Gotzner, N. et al. 2013. *Focus particles and the mental representation of the alternative sets*.

XPRAG (The 5th Biennial Conference of Experimental Pragmatics) 2013, Utrecht, Netherlands.

Grice, P. 1989. *Studies in the way of words*. Cambridge, MA: Harvard University Press.

Gualmini, A. et al. 2001. At the semantics/pragmatics interface in child language. In *Proceedings of Semantics and Linguistic Theory 11*, 231–247. Cornell, Ithaca: CLC Publications.

Herburger, E. 1997. Focus and weak noun phrases. *Natural Language Semantics* 5: 53–78.

Herburger, E. 2000. *What Counts: Focus and Quantification*. *Linguistic inquiry monographs* 36. MIT Press.

Hendriks, P. 2004. *Optimization in focus identification*. *Optimality theory and pragmatics*. Houndmills, Basingstoke, Hampshire: Palgrave/Macmillan.

Hirschberg, J. 1985. *A Theory of Scalar Implicature*. PhD thesis. UPenn.

Hoeksema, J., F. Zwarts. 1991. Some remarks on focus adverbs. *Journal of Semantics* 8: 51–70.

Horn, L. 1972. *On the Semantic Properties of Logical Operators in English*. PhD thesis. UCLA.

Horn, L. 2006. Implicatures. In *The Handbook of Pragmatics*, L. Horn, G. Ward (eds.), 3–28. Blackwell Publishing Ltd.

Katsos, N., D. Anđelković, M. Savić, S. Jošić. 2009. *Semantika kvantifikatora u srpskom. Implikature i domet kod odraslih i dece*. Empirijska istraživanja u psihologiji, Beograd, Srbija.





Katsos, N. et al. 2012. The acquisition of quantification across languages. In *Proceedings of the 36th annual Boston University Conference on Language Development*, A. Biller, E. Chung & A. Kimball (eds.), 258–268. Cascadilla Press.

- Krifka, M. 2008. Basic notions of informational structure. *Acta Linguistica Hungarica*: 243–276.
- Levinson, S. 2000. *Presumptive Meaning*. The MIT Press.
- Milsark, G. 1977. Toward an explanation of certain peculiarities of the existential construction in English. *Linguistic Analysis* 3: 1–29.
- Mirić, M., B. Arsenijević. 2013a. Uloga fokusa i partitivnosti u izvođenju skalarnih implikatura. U *Zbornik radova sa XIX međunarodnog skupa Empirijska istraživanja u psihologiji*. Beograd: Filozofski fakultet, 43–48.
- Mirić, M., B. Arsenijević. 2013b. *The role of educational background in generating scalar implicatures*. XPRAG (The 5th Biennial Conference of Experimental Pragmatics) 2013, Utrecht, Netherlands.
- Mirić, M., B. Arsenijević. 2014. The role of partitive construction in generating scalar implicatures. In *Language Use and Linguistics Structure, Proceedings of the Olomouc Linguistic Colloquium 2013, Olomouc Modern Language Series Vol. 3*, J. Emonds, M. Janebova (eds.), Palacky University Olomouc, pp. 229-238.
- Noveck, I. 2001. When children are more logical than adults: experimental investigations of scalar implicature. *Cognition* 78: 165–188.
- Papafragou, A., J. Musolino. 2003. Scalar implicatures: experiments at the semantic/pragmatic interface. *Cognition* 86: 253–282.
- Partee, B. 1991. Topic, Focus and Quantification. In *Proceedings from Semantics and Linguistic Theory 1. Cornell Working Papers in Linguistics 10*, S. Moore, A. Wyner (eds.), 159–187. Cornell University, Ithaca.
- Rooth, M. 1985. *Association with focus*. PhD thesis. University of Massachusetts, Amherst.
- Rooth, M. 1992. A theory of focus interpretation. *Natural Language Semantics* 1: 75–116.
- Schwarz, F., C. Clifton, L. Frazier. 2008. *Strengthening 'or': Effects of focus and downward entailing contexts on scalar implicatures*. Manuscript. University of Massachusetts, Amherst.
- Spalek, K., N. Gotzner, I. Wartenburger. 2014. Not only the apples: Focus sensitive particles improve memory for information-structural alternatives. *Journal of Memory and Language* 70: 68–84.
- Sperber, D., D. Wilson. 1995. *Relevance: Communication and Cognition*. Blackwell.
- Zondervan, A. 2010. *Scalar Implicatures or Focus: An Experimental Approach*. PhD thesis. University of Utrecht, Netherlands.



**Appendix**

Examples of stimuli (original pictures were in colour)

<p>We picked five apples from the tree.</p>  <p><b>Target item (5/5):</b> Some (of the) apples are on the table. Question: Did Pera see it well?</p>	<p>Five birds live in the park.</p>  <p><b>Filer item:</b> (The) red birds are in the tree. Question: Did Pera see it well?</p>
<p>We brought five bananas from the market.</p>  <p><b>Control item (3/5):</b> Some (of the) bananas are on the table. Question: Did Pera see it well?</p>	<p>We got five balls for birthday.</p>  <p><b>Control item (0/5):</b> Some (of the) balls are on the table. Question: Did Pera see it well?</p>