

THE ACQUISITION OF PREPOSITIONS IN SERBIAN: FACTORS AND MECHANISMS OF DEVELOPMENT

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The study proceeds from the results of the previous studies showing that the distributional characteristics (frequency) of language input are crucial for the acquisition of prepositions (Savić & Anđelković, 2005, in preparation). The authors analyze deviations in the distribution of prepositions in children's spontaneous speech from the prediction made on the basis of the distributional characteristics of prepositions in adult language. The results show that, in comparison with adult language, only the prepositions «kod» (at, by, near, beside) and «sa» (with, from, off) deviate from the prediction. It was also found out that the unexpectedly early and frequent use of the preposition «kod» in child speech stemmed from the frequent use of this preposition in child-directed speech. On the other hand, the preposition «sa», which is very frequent in child-directed speech, is not present in children's production at the earliest age, because its homonymy makes it cognitively complex. The analysis of the reasons for such a deviation provided a basis for the discussion about the possible factors and mechanisms of development: the distributional characteristics of adult language are the major factor of acquisition, but the effects of conceptual and structural complexity were recorded as well.

Key words: language acquisition, prepositions, distribution, corpus, child language, child-directed speech

Prepositions in Serbian are defined as undeclined functional words which are used before certain case forms of noun phrases to express their relationship towards other words in the sentence, as well as to determine that relationship more precisely (Ivić, 1957; Stevanović, 1964; Stanojčić, Popović & Micić, 1989).

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The crossing of the syntactic and semantic dimensions of prepositions in Serbian is especially interesting from a developmental aspect, because that makes them cognitively demanding for acquisition: in order to understand a certain prepositional-case phrase, it is necessary to know what relationship is expressed by the preposition (i.e. the relationship in space and time, cause, objective, measure, purpose, company, means...), as well as the way in which it defines the meaning of the noun placed after it in the context of the whole syntactic structure of the sentence. In view of the fact that a limited number of prepositions in different languages is used to express some universal relations, which are cognitively relevant to all humans, it is especially interesting to monitor the acquisition of mastery over that unique semantic field through the acquisition of prepositions. This can provide an insight into the mapping of real-world relations onto the cognitive plane by means of language, and the order of preposition acquisition itself – into the cognitive status of those relations in terms of their universality, relevance and simplicity.

The study, which was conducted on the sample of children's spontaneous speech while acquiring Serbian at the age of 1;8 to 3;8 (Savić & Anđelković, 2005, in preparation) pointed out that the frequency of prepositions or, in other words, the rate of their occurrence in adult language was essential for the acquisition of prepositions. It was also found out that there was a great similarity between the distribution of prepositions in child speech and that in adult language. This finding speaks in favour of a distributional approach to language acquisition (Finch & Chater, 1992; Maratsos, 1979; 1988; in: Redington, Chater & Finch, 1998).

The basic assumption of distributional approach to child language development (Maratsos, 1988, in: Lieven, Pine & Baldwin, 1997) is that an important role in language acquisition, especially morphology, is played by the “passive” registration of statistical, distributional regularities among words in the language. This means that, at the beginning, the child does not have to understand the meaning of the morphemes it uses, nor their grammatical relationship with other morphemes to which they are syntagmatically or paradigmatically linked. Lieven et al. (Lieven, Pine & Baldwin, 1997; Lieven, Behrens, Speares & Tomasello, 2003) extend this view to the acquisition of lexemes as well. Namely, they hold that certain lexemes, which frequently occur together in speech, are acquired by the child «by heart», as a pattern or a unit and that this is the initial phase of their acquisition. The child gains mastery over the semantic and syntactic properties of these lexemes subsequently and gradually, through their use in different situations and in combination with other words. The implication of this view is that the occurrence of lexical categories and grammatical rules in child speech is the result of distributional, statistical language regularities rather than of the innate grammatical structures or the development of semantic and cognitive prerequisites.

Within this approach, it is also possible to interpret the results of Rice's corpus research (1999) related to an analysis of the early acquisition of the prepositions *to* and *for* in English. They suggest that cognitive prerequisites are not at the basis of

the initial acquisition of these prepositions, because the use of their cognitively simpler variants does not necessarily precede the use of cognitively more complex ones. According to Rice, the major factors in the occurrence of these prepositions in early child speech are: (a) the frequency of prepositions in child-directed speech; (b) co-occurrence preferences and (c) experiential utility. This prompted Rice to conclude that external/environmental factors were more significant for the acquisition of certain aspects of language than internal/cognitive ones, thus pointing to a major (yet not new) theoretical problem: how the child acquires words or constructions, the meaning of which it has not yet cognitively mastered.

Considering the results relating to the acquisition of prepositions in Serbian, which support a distributional approach, in this study we set out to investigate whether it was possible to determine the effects of some other developmental factors in the data so obtained, in addition to frequency as the decisive factor of acquisition.

THE FREQUENCY OF PREPOSITIONS AS THE FACTOR OF ACQUISITION

Previous study, which was devoted to an analysis of the distribution of prepositions in children's spontaneous speech, at the age of 1;8 to 3;8 (Savić & Anđelković, 2005, in preparation), enabled us to gain an insight into the use of prepositions in children's spontaneous speech or, in other words, how frequently they were used and how the distribution of prepositions in child speech looked like in comparison with adult language. The distribution of preposition probabilities in child speech was obtained by searching *Serbian Electronic Corpus of Children's Early Language* (Anđelković, Ševa & Moskovljević, 2001) and then comparing it with the distributions of preposition probabilities in three samples of adult speech/language: *Corpus of Serbian Language* and *Frequency Dictionary of Contemporary Serbian language* (Kostić, 1999; 2001), *Discourse Serbo-Croatian Language* (Savić & Polovina, 1989) and *Child directed speech* (CDS) (the samples of adult speech from *Serbian Electronic Corpus of Children's Early Language*, Anđelković, Ševa & Moskovljević, 2001).

The study confirmed the results of some earlier studies (Anđelković, 1997; 2000a; 2000b). The frequency and number of different prepositions increase with age, and the first prepositions occurring in children's spontaneous speech are: *u* (in, into, at), *na* (on), *za* (for, at, to, towards) and *kod* (at, by, near, beside). These prepositions (with the exception of *kod*) are also the most frequent in adult language, which is in conformity with the findings that the frequency of prepositions in adult language is a good predictor of the frequency and acquisition order of prepositions in child speech.

It was shown that the distribution of preposition probabilities in child speech was governed by the same rules as that in adult language. In other words, the distribution of prepositions in adult language (all three samples of adult language) determines in large measure the distribution of prepositions in children's spontaneous speech at the earliest age already (coefficients of determination are over 0.70, Figure 1).

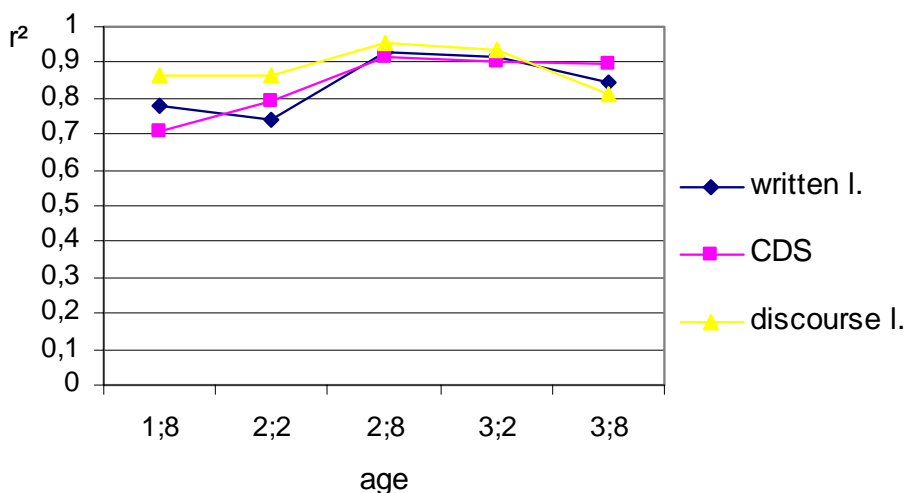


Figure 1: Dependence of the distribution of prepositions in child speech on the distribution of prepositions in adults' written language, adults' discourse language and child-directed speech (Savić & Anđelković, 2005, in preparation).

There is some increase in the similarity of distributions with age, but at the age of 2;8 already, the coefficients of determination between the distribution of prepositions in children and that in adults reach the level obtained by comparing the pairs of preposition distributions in different samples of adult language, written, discourse and CDS, which range from 0.85 to 0.96 (Savić & Anđelković, 2005, in preparation).

These findings support the view that frequency is one of very important factors in the initial phase of preposition acquisition. At its earliest age already, when it begins to use prepositions in its speech, the child does that in a similar way like adults (i.e. in a similar proportion relative to other prepositions). Should we wish to describe the course of development of the prepositional system on the basis of these findings in greater detail, we would be faced with the fact that it is not possible to gain a clear insight into the course of development of the prepositional system by monitoring the distribution of prepositions at different ages and comparing it with the distribution of prepositions in adult language, because the distribution of prepositions in child speech has all the characteristics of this distribution in adult speech.

However, the results also pointed out that the coincidence of the distributions of prepositions in children and in adults was lower at an earlier age (1;8 and 2;2) and that the increase in the coefficients of determination was statistically significant up to the age of 2;8 (Savić & Anđelković, 2005, in preparation). In this paper we will proceed on the assumption that the lower coefficients of determination at an earlier age point to certain developmental changes. We pose the question as to what these changes include or, in other words, what deviation can be observed in children at an earlier age as compared to the distribution of prepositions in adult language. Consequently, we set out to reconsider the distributional characteristics and search for changes that can be attributed to the development process.

OTHER POSSIBLE FACTORS OF PREPOSITION ACQUISITION

As opposed to the modern distributional approach, the already classical psycholinguistic studies (unless they anticipate the innate language structure as the basis for acquisition - *nativism*) emphasize the significance of cognitive preconditions for the development of language and the structural properties of the language system themselves.

Brown (1973), Clark (1977, in: Johnston & Slobin, 1979), as well as Parisi and Antinucci (1970) show that the first prepositions to be acquired are those expressing cognitively simpler spatial relations: *u* and *na* (containing/encompassing, support), which is also in conformity with Piaget's and Inhelder's theses about the development of spatial notions (Piaget, Inhelder & Szeminska, 1970; Piaget & Inhelder, 1971; Piaget & Inhelder, 1978).

Johnston and Slobin also arrived at such a conclusion (1979). However, they hold that, in addition to *conceptual development*, the acquisition order of linguistic forms (locative expressions) is influenced by the *degree of complexity of the language structure*. Should the acquisition of locative expressions be based only on cognitive prerequisites, there would be a universal order of their acquisition in all languages, as the expression of universal cognitive development in interaction with the standard communication environment. However, this is not always the case. These authors hold that there is a time lag between the child's communication intention and its gaining mastery of linguistic tools so as to realize its intention. The duration of this time lag is determined by the structural properties of the language, which influences the ease with which the relevant forms are observed or the conventions for mapping the content onto the form are discovered. As the specific language factors, which may accelerate or slow down the child's search for the semantic rules within the limits set by conceptual development, Johnston and Slobin (1979) regard, inter alia, *lexical diversity* for expressing the same relationship, *morphological complexity of the lexeme* and *homonymy*.

In addition to these, more recent results relating to the use of prepositions in children's spontaneous speech (Savić & Anđelković, 2005, in preparation), let us recall some earlier longitudinal studies of children's spontaneous speech in Serbian (Mikeš & Vlahović, 1966a; Mikeš & Vlahović, 1966b; Mikeš, 1973; Savić & Mikeš, 1974; Jocić, 1980-1981; Kostić & Vladislavljević, 1995). They show which prepositions occur first in child speech (*u* /in, into, at/, *na* /on/, *iz* /from, out of/ and *kod* /at, by, near/) and at what age. However, the implicit assumption of these studies is that the very occurrence of a preposition in children's spontaneous speech is the sign that the child has acquired it and that, at the age of about 3 years already, it uses prepositions competently, since there is a great number of them in its speech.

A different light on such an approach is shed by the experimental findings of Anđelković (1997; 2000a; 2000b), who studied the understanding of noun (prepositional-case) syntagms by children aged between 3 and 6 years. The results show that, although some cases and prepositions and their combinations occur in children's spontaneous speech, in the experimental situation the understanding of prepositions varied, while some prepositions were not fully understood even at the age of 6. Although a 3-year old child uses spontaneously a great number of prepositions correctly, that does not mean that it really mastered all meanings and relations expressed by those prepositions. The mastering of all relations is a much longer process than it may seem. By applying statistical method, Anđelković (1997; 2000a; 2000b) singled out three factors considering them to be relevant to the understanding of the acquisition of prepositional-case syntagms: *functions and meanings* of prepositions, *cognitive complexity of the relations* expressed by prepositions and the *frequency of prepositions*.

It should be noted that this finding shows which three factors are relevant to acquisition, but we do not see how they act or, in other words, where and how their effects can be observed. In this study we proceeded on the assumption that a deeper insight into the distributions of propositions in child speech at an earlier age, would enable us to identify more precisely the source of deviation from the distribution of prepositions in adult language, i.e. to observe more precisely the effects of those factors which were not of a statistical or distributional nature as well.

PROBLEM

One of the basic findings of Savić and Anđelković (2005, in preparation) was that the similarity of probability distributions in children and in adults increased with age, i.e. the coefficients of determination were lower at the child's earlier age (1;8 and 2;2).

Of interest for this research were the characteristics of probability distribution at the earliest age, i.e. which prepositions deviated from something that was characteristic of adult speech/language and was statistically reflected in a decrease in the coefficient of determination. Consequently, we were interested to find out which prepositions were in question and, possibly, what reasons underlied such a status in child speech relative to adult language.

METHODOLOGY

The study included a quantitative analysis of the distribution of prepositions in children's spontaneous speech and in specified samples of adult language. By employing the statistical methods (regression analysis), the conclusions about the statistical dependence of the former on the latter, as well as about the points of deviation of the former relative to the latter were derived. In addition, an analysis of the semantic and structural properties of the deviating prepositions was made. In order to make a more detailed analysis of the course of development of the prepositional system, we also made a qualitative analysis of the use of specified prepositions in those cases when it could elucidate or illustrate the basic characteristics of the process and mechanisms of preposition acquisition.

Searching the Corpus

It was the question of the study based on the search of the corpus of children's spontaneous speech and adult language corpus.

To extract the prepositions from the children's corpus, the option of the CLAN program within the CHILDES package (MacWhinney, 1989) was used. This option enables the listing of the words uttered by the speaker in question, including their frequency. After considering the verbal and non-verbal context of each word, it was decided as to whether it was the question of a preposition.

The data on the distribution of prepositions in adult language, based on *Corpus of Serbian Language* (Kostić, Đ, 2001), were obtained by having an insight into the frequencies from *Frequency Dictionary of Contemporary Serbian language* (Kostić, Đ, 1999).

It should be noted that the size and nature of the available corpora also influenced the different frequency of prepositions in them. In *Frequency Dictionary of Contemporary Serbian language* one can find 65 different prepositions, while in the sample of child-directed speech (CDS) 41 different prepositions were found and in the corpus of discourse language - 38. In the sample of child speech, which we

had searched, a total of 21 different prepositions was found. While comparing the probability distributions, only the prepositions found in the children's sample were taken into account.

Sample

The sample of subjects or, to be more exact, the sample of children whose speech was longitudinally recorded, consisted of eight children, 4 female and 4 male, four from Belgrade and four from Banja Luka. The analysis was conducted on the sample of children at five different ages in the span of 2 years (1;8, 2;2, 2;8, 3;2 and 3;8), at 6-month intervals.

Data Processing and Analysis

By recording the frequency of prepositions for each of the eight children at five different ages, we obtained their proportion in the total frequency of prepositions at one age. The variance percentage in the distribution of preposition probabilities in children, which can be explained by the amount of variance in the probability distribution in adults, was determined by using regression analysis (coefficients of determination). We treated the frequency (proportion) of prepositions in adult speech/language as an independent variable, proceeding on the assumption that it could be the predictor of the frequency and acquisition order of prepositions in child speech. In order to get a more detailed picture as to how the distribution of preposition probabilities in child speech would look like in adult language, we included only those prepositions which were found in child speech. Since the basic assumption was that the distribution of preposition probabilities in child speech varied with age, the probability distribution within each age was compared with the probability distribution in adult language from different samples. This enabled us to monitor how the explained variance percentage in the probability distributions on the sample of child speech changed with age (r^2).

Serbian Electronic Corpus of Children's Early Language

The material for *Serbian Electronic Corpus of Children's Early Language* (Anđelković, Ševa & Moskovljević, 2001) was collected during the period 1998-2002. It consists of video records of spontaneous interaction between children and adults from their social environment. The recordings were made longitudinally,

beginning with the age of 18-48 months, and lasted 90 minutes each, at 2-month intervals, so that the corpus comprised 16 ages.

The material from video tapes was transcribed into electronic form according to the CHILDES system (MacWhinney, 1989; MacWhinney & Snow, 1985), the international system for data collection, transcription and analysis which facilitates the exchange and comparability of the results obtained from different corpora in the CHILDES database.

Adult Language Corpora

The most reliable source for monitoring the distribution of linguistic units in Serbian is *Frequency Dictionary of Contemporary Serbian language* (Kostić, Đ, 1999) which was derived from *Corpus of Serbian Language*, (Kostić, Đ., 2001, www.serbian-corpus.edu.yu).

However, one should bear in mind that there are differences between written and discourse language and that those differences can be of utmost significance for our comparisons. Namely, the child's basic language »input« during language development is discourse language. In comparison with discourse language, written language is more standardized, so that it can be regarded as »purer« to a degree. Discourse language is more concrete, contains presuppositions, relies on the context, situational clarity and the like. Discourse language often contains incomplete sentences, »non-grammatical« utterances, non-standard constructions, idiolects and the like. Consequently, there is no doubt that the data on adults' discourse language are of special significance for our study. In this regard, we had the following two sources at our disposal:

Discourse Serbo-Croatian Language (Savić & Polovina, 1989) – the collection of transcribed audio records of adults' spontaneous language in everyday situations;

Serbian Electronic Corpus of Children's Early Language (Anđelković, Ševa & Moskovljević, 2001) or, more precisely, those segments of the corpus containing adults' utterances - *child-directed speech* (CDS).

The distribution of preposition probabilities in adult language, which is of interest for our study, was derived from all three sources and the anticipated comparisons with the distribution of prepositions in child language were made.

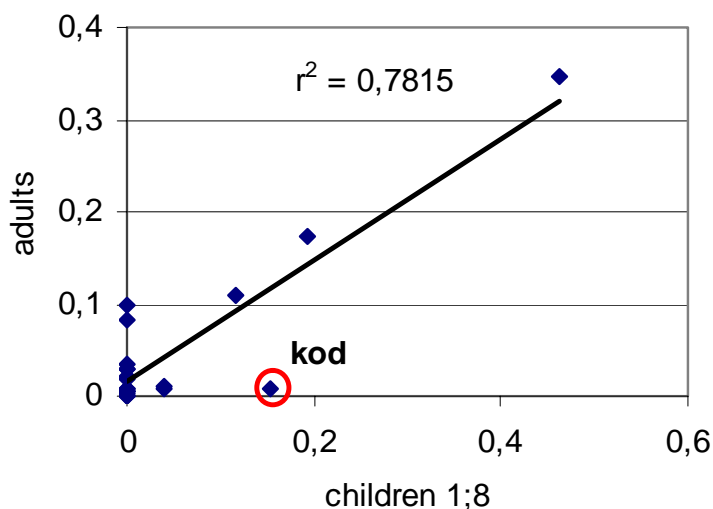
RESULTS

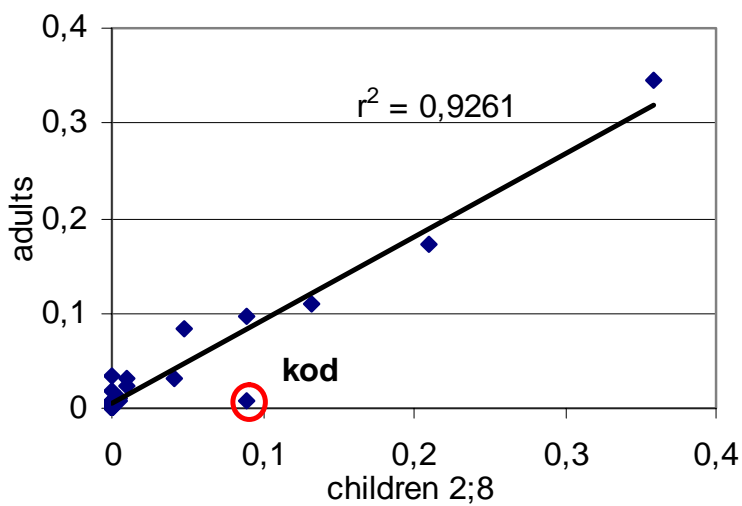
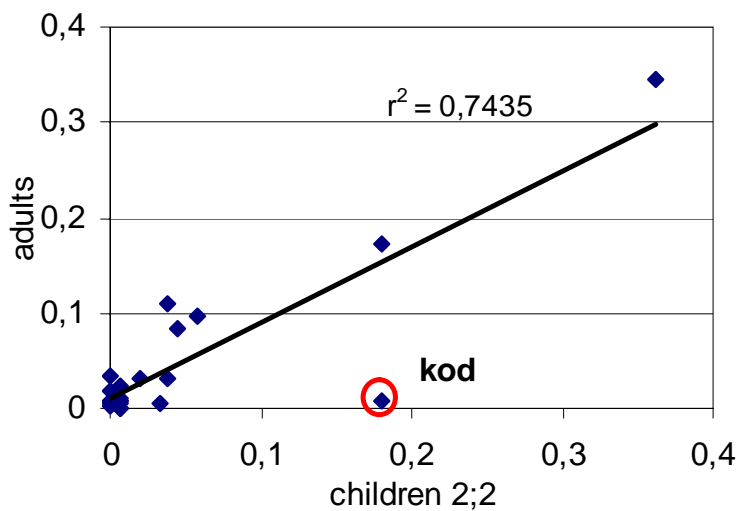
The basic aim of this study was to identify the prepositions deviating the most from the distributions of prepositions in adult language by observing these distributions at specified ages.

Deviation of the Preposition «kod»

A Comparison with Written Language

We started our study by making a comparison with the sample of written language as the most representative sample at our disposal. Figure 2 shows that the preposition *kod* deviates the most, regardless of age (except at 3;8).





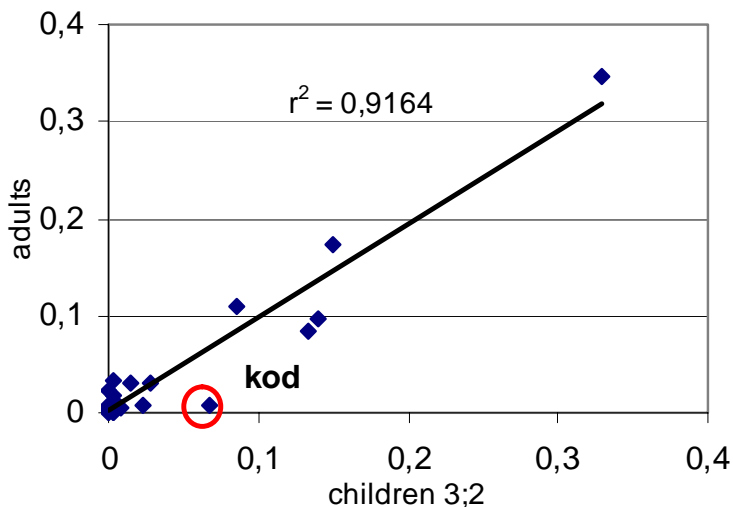


Figure 2: «Deviation» of the preposition *kod* at the age of 1;8, 2;2, 2;8 and 3;2 from the prediction based on adult language.

The ordinate denotes the proportion of prepositions in adult language, while the abscissa denotes the proportion in child speech (the preposition "kod" is encircled). The results show that the preposition *kod* occurs in child speech unexpectedly early (at the earliest age already) and unexpectedly frequently. In contrast to other prepositions, which occur early and are also highly frequent in adult language, *kod* falls into the group of medium-frequent prepositions in adult language. This means that the preposition *kod* has a different status relative to other prepositions, which will be discussed in more detail in further text.

In order to check whether the preposition *kod* really has a special status, we repeated our comparison of the distributions of preposition probabilities in child speech and in adult language (written). This time, however, we omitted the preposition *kod* assuming that the distribution of prepositions in child speech and in written language would then become more similar (Figure 3).

r ² children and written language		
Age	With "kod"	Without "kod"
1;8	0,7815	0,8793
2;2	0,7435	0,9307
2;8	0,9261	0,9722
3;2	0,9164	0,9436
3;8	0,8458	0,8499

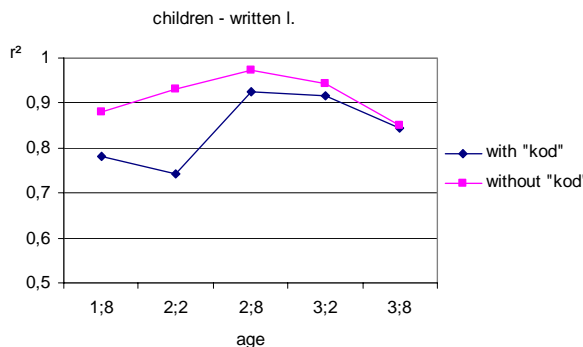


Figure 3: A similarity between the distributions of prepositions in child speech and in adult language, with and without the preposition *kod*.

Without the preposition *kod*, the similarity of probability distributions in adult language and in child speech at an earlier age increased. The coefficients of determination increased regardless of age, except for the age of 3;8 and, in particular, at the earliest ages, 1;8 and 2;2.

There could be two reasons for such a result:

1. The preposition *kod* in child speech is used differently than in adult language;
2. This difference arises from the difference between written language and verbal communication.

A Comparison with Discourse Language

In order to determine whether it is the question of the second reason (given under (b)), we compared the probability distributions in child speech and adult language, whereby the adults' probability distribution was derived from the sample of discourse language. If the difference in the status of the preposition *kod* in child speech and in written language arises from the difference between written and spoken language, the omission of the preposition *kod* from the distributions of child speech and discourse language should not affect the coefficient of determination, since both samples refer to discourse language.

r ² children and discourse language		
Age	With "kod"	Without "kod"
1;8	0,8607	0,8876
2;2	0,8654	0,9504
2;8	0,9576	0,9611
3;2	0,9357	0,9357
3;8	0,8145	0,8203

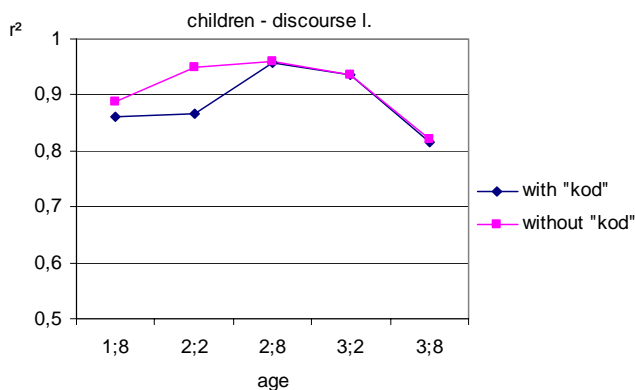


Figure 4: A similarity between the distributions of prepositions in child speech and in discourse language, with and without the preposition kod.

Figure 4 shows that r^2 increased slightly at the age of 1;8 and that the difference is greater at the age of 2;2. This points to the fact that the different status of the preposition *kod* in child speech at an earlier age relative to written language cannot only be explained by the difference between these two samples in the spoken/written language dimension (r^2 increased at 2;2).

The fact that this dimension has an influence on the «behaviour» of the preposition *kod* was partially confirmed by an insight into its proportion in the samples of adult language. The proportion of the preposition *kod* in discourse language (0.0606) is almost nine times higher than in written language (0.0071)². This prompted us to investigate the status of the preposition *kod* in the sample of child-directed speech.

Is the Preposition «kod» Used Differently in Child Speech Relative to Child-Directed Speech?

The question that imposes itself is how much the similarity of the distributions of preposition probabilities in child speech and CDS increases when preposition *kod* is omitted from the analysis (Figure 5). If it is the question of the difference between speech and written language, the coefficients of determination should not be

² The proportions of prepositions in the samples of adult language and child speech are given in Appendix 1.

changed more significantly, because we compare two distributions from the samples of spoken language.

r ² children and CDS		
Age	With "kod"	Without "kod"
1;8	0,7056	0,7023
2;2	0,7934	0,8215
2;8	0,9164	0,9162
3;2	0,9034	0,9087
3;8	0,8973	0,9261

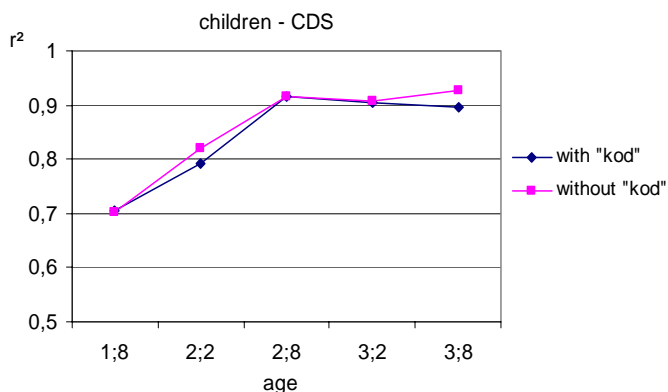


Figure 5: A similarity between the distributions of prepositions in child speech and in CDS, with and without the preposition *kod*.

Figure 5 shows that the coefficients of determination did not change more significantly when the preposition *kod* was omitted. Consequently, the preposition *kod* is used similarly in child speech and in child-directed speech.

Since child speech and CDS bear similarity, while similarity of child speech and the sample of discourse language was not so unambiguous, the question arises as to whether CDS has some other specificity which makes it more similar to child speech insofar as the preposition *kod* is concerned. The way to determine this was to check whether child-directed speech was adjusted to children's age.

Is There the Adjustment of CDS to Children's Age?

In order to determine whether is the adjustment of CDS to children's age, we compared the distributions of preposition probabilities in CDS (at different age³ of the child addressed by adults) with the distribution of preposition probabilities from the sample of written language. Consequently, in our analysis, the distribution of CDS over 5 ages was correlated with the distribution of written language. If adults' speech is adjusted to the age of the child to which it is directed, the coefficients of determination of CDS, as compared to written language, should be lower at earlier

³ As opposed to written and discourse language, our data on CDS included not only the summary distribution of prepositions, but also the distributions of prepositions by age of the child being addressed by adults (1;8, 2;2, 2;8, 3;2 and 3;8).

ages, as was the case with the coefficients of determination when the samples of child speech and written language were compared.

The results are shown in Figure 6. In comparison with written language, the coefficients of determination of CDS are lower when adult speech is directed to the child at the age of 1;8 and 2;2. This means that adults adjust their speech when addressing the youngest children.

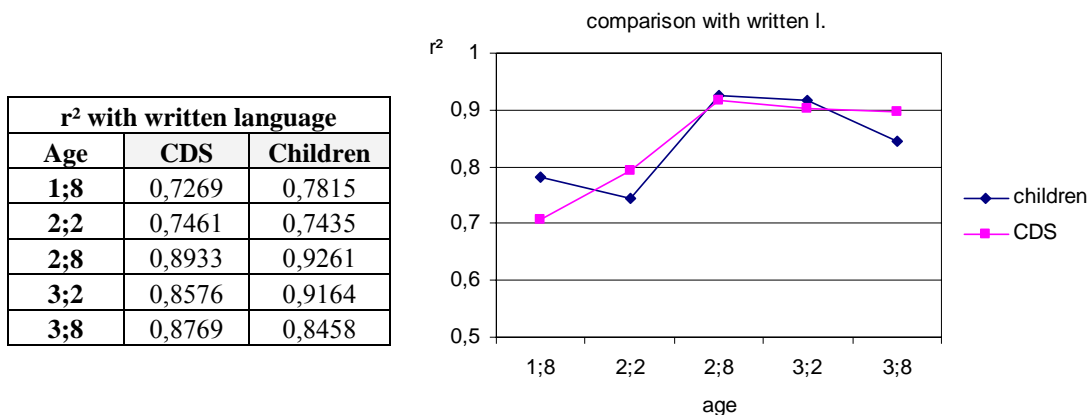


Figure 6: A similarity between the child/written and CDS/written distributions of prepositions.

Deviation of the Preposition “kod” in CDS Relative to Written Language

There are now two findings that should be further considered:

1. It was observed that the distribution of preposition probabilities deviated to a greater extent at an earlier age as compared to the probability distributions in adult language, whereby the deviation of the preposition *kod* was especially evident;

2. The deviation of the probability distribution in CDS from the standard distribution in adult language shows that adults adjust their speech when addressing younger children.

The question that imposes itself here is as follows: in what way CDS deviates from standard adult language, i.e. whether the preposition *kod* in child-directed speech (CDS) has a specific status like in child speech? Therefore, our next step was to check whether the CDS probability distribution at an earlier age would be more similar to the probability distribution of written language should the preposition *kod* be omitted.

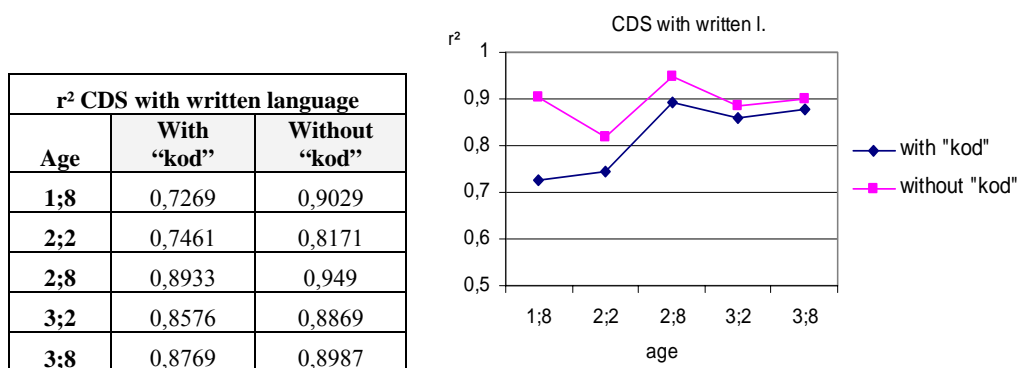


Figure 7: A similarity between the distributions of prepositions in written language and in CDS, with and without the preposition *kod*.

Figure 7 shows that r^2 increased, especially at 1;8 and, to some degree, at 2;2. This confirms that adults also use the preposition *kod* more frequently when addressing younger children, as compared to standard language (written).

The Summary Regarding the Status of the Preposition «*kod*»

We will sum up in brief our findings concerning the status of the preposition *kod* in different language samples. The fact that the proportion of the preposition *kod* in discourse language is almost nine times higher than in written language (0.0606 vs. 0.0071) remains without a clear explanation for the time being. One of the possible explanations could be linked to the meaning of the preposition *kod*. It is most frequently used in a positional context, as well as to indicate the place where an action ends up. In other words, it is used together with dynamic state and static state verbs. It is possible that the sensorimotor characteristics of the physical environment of two collocutors are more evident and more significant in discourse language than in written language, where such a common sensorimotor environment does not exist.

In conversational communication, the preposition *kod* is also more frequent in child-adult communication, especially at an early age, when it is used both by children and adults twice as frequently as in the case of adults talking to each other. The use of the preposition *kod* in child-adult communication seems to be pragmatically significant and is identifiable through typical utterances being frequent in early verbal communication (e.g. «*idemo kod bake*» /we are going to grandma/; «*dođi kod mame*» /«come to mummy/; «*hoću kod tate*» /«I want (to

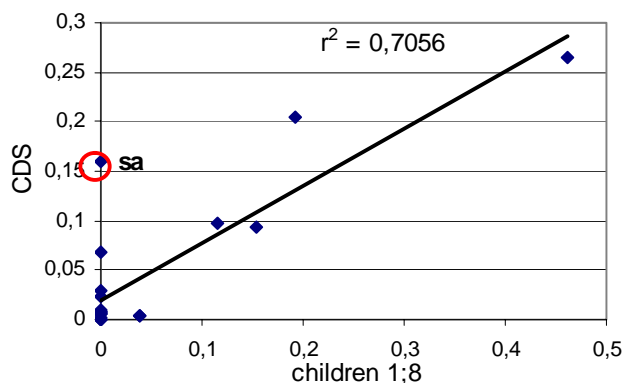
go to daddy»/). It occurs at an earlier age, but it evidently loses its specific function and significance in interaction with adults at 2;8 already, when it is used both in child speech and in CDS in a similar proportion like in the sample of discourse language.

As to the question whether the preposition *kod* is used differently in child speech than in adult language, or whether this difference arises from a difference in written language and in oral communication, it can be answered in the following way: the preposition *kod* is used much more frequently in discourse language than in written language and this deviation is even higher when adults address younger children. Therefore, children acquire the preposition *kod* at a very early age and use it much more frequently than it can be predicted on the basis of the distribution in standard written language.

Deviation of the Preposition *sa* (with, from, off)

The lower coefficients of determination at the earliest ages (1;8 and 2;8) can partially be explained by the different status of the preposition *kod* in child speech as compared to the samples of written and discourse language. The preposition *kod* «behaves» in a similar way in child language at an early age (1;8 and 2;2) and in adults' speech directed to children of that age (CDS at 1;8 and 2;2). Thus, it would follow that child speech and CDS coincide at the earliest age already or, in other words, one can expect high and uniform coefficients at any age.

However, the results show that the lower coefficients of determination at the earliest age are also obtained when the distributions of preposition probabilities in child speech and CDS are compared (see Figure 1). Therefore, one can pose the question as to how these deviations can be explained, i.e. in what way child speech differs from CDS. The scatter diagram shows that the preposition *sa* (with, from, off) deviates the most from the regression line (Figure 8).



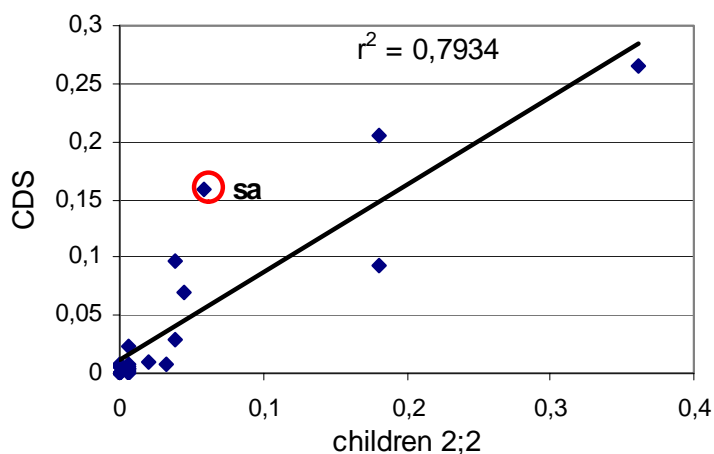


Figure 8: "Deviation" of the preposition *sa* at the age of 1;8 and 2;2 from the prediction based on CDS

When these distributions are compared, whereby the preposition *sa* is omitted, we can observe an increase in the coefficients of determination at an earlier age (Figure 9).

r ² children and CDS		
Age	With "sa"	Without "sa"
1;8	0,7056	0,8696
2;2	0,7934	0,8779
2;8	0,9164	0,9691
3;2	0,9034	0,9018
3;8	0,8973	0,8935

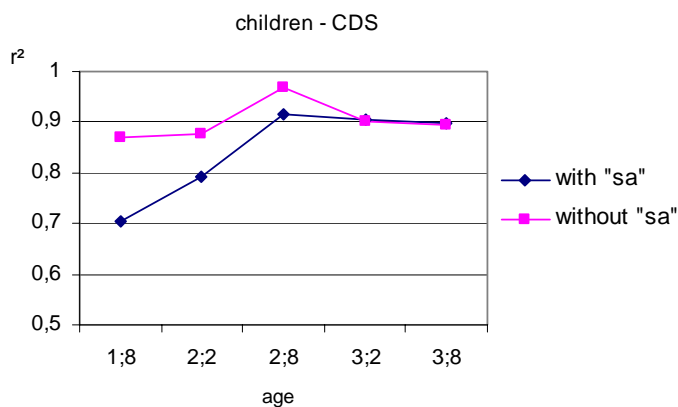


Figure 9: A similarity between the probability distributions in the samples of child speech and CDS, with and without the preposition *sa*.

Such a result prompted us to compare the status of the preposition *sa* in child speech with other two samples – the samples of written and discourse language. The scatter diagrams show that, after *kod*, the preposition *sa* deviates the most in child speech at the earliest age (1;8), as compared to the samples of written and discourse language (Figure 10). The preposition *sa* does not rank among the first six prepositions in child speech at that age, while according to the prediction based on adult speech/language (the fourth preposition according to its frequency), it should be among the first four prepositions.

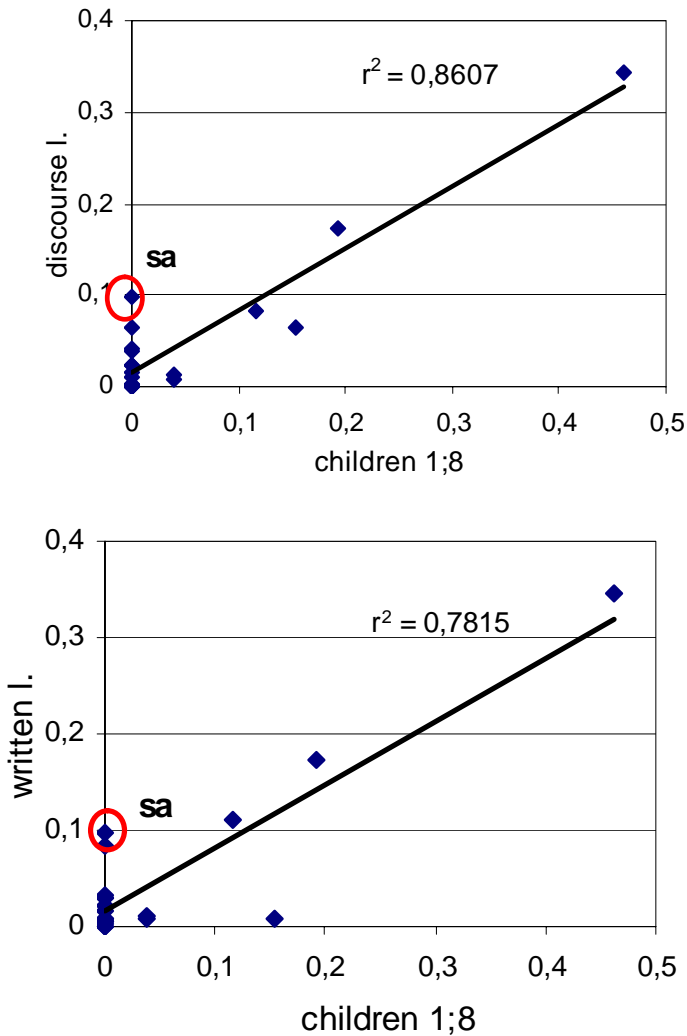


Figure 10: «Deviation» of the preposition *sa* at the age of 1;8 from the prediction based on written (left) and discourse language (right).

In contrast to the preposition *kod*, which is more frequent in child speech at an early age than in adult speech/language, the preposition *sa* – which is highly frequent in adult speech – occurs for the first time in our sample of child speech at the age of 2;2. At this age, the child already uses this preposition in the same proportion as adults (in the samples of written and discourse language). It is also interesting to note that the preposition *sa* is more frequent in CDS (0.159) than in the samples of written (0.098) and discourse language (0.097).

Are «kod» and «sa» the Only Prepositions that Deviate?

The question that imposes itself here is whether the deviation of the prepositions «kod» and «sa» in child speech relative to adult language represents the only difference of the prepositional system of child speech as compared to developed language.

When the prepositions *kod* and *sa* are excluded from the distributions of preposition probabilities in the children's corpus and the corpus of written language, or the corpus of discourse language, with which we compare them⁴, the coefficients of determination converge distinctly to those at an older age (Figures 11 and 12). This means that the deviation of the distributions of preposition probabilities in child speech from those in adult language and, in particular, in adults' written language can be largely explained by the specific use of these two prepositions in child speech.

r ² children and written language		
Age	All	Without "sa" and "kod"
1;8	0,7815	0,9272
2;2	0,7435	0,9378
2;8	0,9261	0,9724
3;2	0,9164	0,9572
3;8	0,8458	0,8597

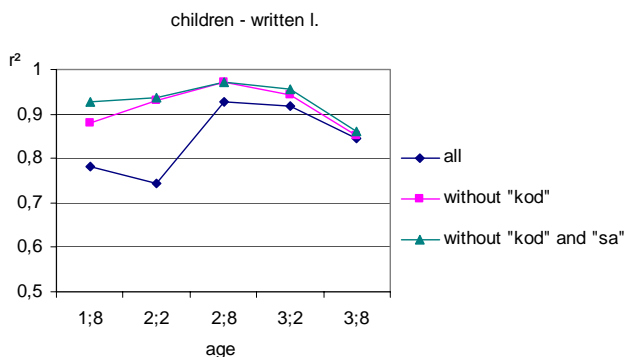


Figure 11: A similarity between the distributions in child speech and written language, with and without the prepositions *kod* and *sa*.

⁴ Such a comparison was not made for child speech/CDS, because the preposition *kod* does not deviate from CDS relative to the sample of child speech (Figure 5), while the deviation of the preposition *sa* is shown in Figure 9.

r ² children and discourse language		
Age	All	Without “sa” and “kod”
1;8	0,8607	0,9388
2;2	0,8654	0,959
2;8	0,9576	0,9614
3;2	0,9357	0,9472
3;8	0,8145	0,8263

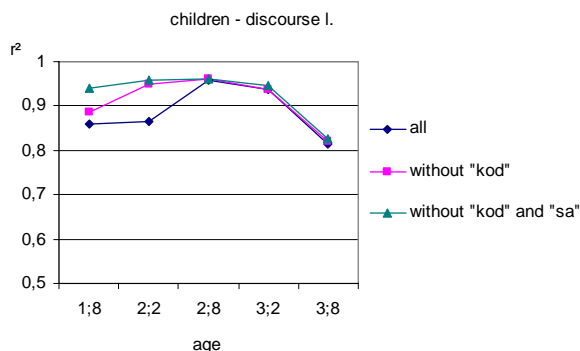


Figure 12: A similarity between the distributions of child speech and discourse language, with and without the prepositions *kod* and *sa*.

In summing up these findings it can be stated that only two prepositions, *kod* and *sa*, have a different status in child speech, as compared to the samples of adult speech and written language. According to our findings, the preposition *kod* is used more frequently in spoken language than in written language. In comparison with discourse language, the preposition *kod* is proportionately used more frequently in child speech at an earlier age, as well as in adult speech directed to children at that age. The preposition *sa* deviates, because children do not use it in their speech at the earliest age (1;8), while in CDS (0.159) it is used more frequently than in adults' discourse language (0.097) or in written language (0.098).

What is most likely common to these two prepositions is their relevance to child-adult verbal communication from a social aspect.

The preposition *kod* in Serbian is most frequently used in a positional context, as well as to indicate the place where an action is brought to an end. An insight into children's utterances, in which the preposition *kod* is used, shows that these meanings are the most frequent in child speech as well. However, what differs the use of this preposition from that in adult language is the fact that it is mostly used when referring to the social relations e.g. in a positional context: “*Oću kod Bojane*” («*I want /to go/ to Bojana*»), «*Oću ja kod tebe*» («*I want /to go/ to you*»), or to indicate the place where movement is brought to an end: “*I Miloš ide kod majstora*” («*Miloš also goes to the mechanic*»), “*Mogu li ja kod Milice*” («*May I /to go/ to Milica*»). The frequent use of the preposition *kod* can be interpreted as the manifestation of the need to include the meaning of commonness of the adult and the child in the language as well. It seems that this social need is especially important for the youngest children as well as for adults addressing children of that age, because the child is then referred to joint activities with adults to a maximum;

in addition, most of its activities is mediated by adults. It can be assumed that such use of the preposition *kod* changes at 2;8, either because the child becomes more independent in a physical and social sense, or because it also differentiates other relations, which become important to it for interaction with the environment.

In our sample of CDS the preposition *sa* is most frequently used to express companionship and community, as well as in an ablative sense (separation from a place). The more frequent use of this preposition in child-directed speech can be explained, like in the case of the preposition *kod*, by some kind of social commonness emphasized in the child's and adult's activities (“*Hajde s mamom*”/»Let's go with mummy»/; «*A da zoveš baku, da pričaš s bakom?*» /»How about calling grandma, to talk to grandma?»/; »*Evo 'oće Anđela da s tobom priča*» /»Here! Anđela wants to talk to you»/). However, we can ask ourselves why the preposition *sa* does not occur in the speech of the youngest children, considering its presence and relevance in communication with adults. It seems that the relations expressed by this preposition are cognitively more demanding, because the preposition *sa* in Serbian is a homonym. The same preposition is used to express two (or even three) completely different meanings: one is companionship and community («*pravim sa mamom kolače*» /»I am making cookies with mummy»), and the other is an ablative one («*podigao je knjigu sa stola*» /»he picked up the book from the table»). In child speech and, at times, in adult language as well, the preposition *sa* is also used to indicate means («*hajde sa nekim igračkama da se igramo*» /»let's play with some toys»). Homonymy is a limiting factor in preposition acquisition and makes this preposition cognitively demanding (Johnston & Slobin, 1979; Tomasello, 1987).

FACTORS OF PREPOSITION DEVELOPMENT

The results of the earlier studies, cited at the beginning of this study (Rice, 1999; Savić & Anđelković, 2005, in preparation) show unambiguously that the distribution of prepositions in language input is crucial for preposition acquisition. This finding refers especially to the initial stage of development.

On the other hand, the results presented in this study enable one to locate the effects of cognitive and pragmatic factors specifically on two prepositions, *kod* and *sa*, and also to determine modalities of their impact. Namely, the special status of these two prepositions in child speech at an early age and their pragmatic relevance, which has already been mentioned, points to two different things. In the case of the preposition *kod*, the frequency of its use in the sample of child-directed speech (CDS) is one of the major predictors of its frequency and order of occurrence during development. However, the status of the preposition *sa* confirms that this is the case

only if there is no obstacle posed by other cognitive or structural factors. Despite the fact that the frequency of the preposition *sa* in CDS is rather high, it does not occur at the earliest age, because it seems that homonymy makes this preposition cognitively demanding. In the case of the preposition *kod*, the pronounced pragmatic relevance of these two prepositions to child-adult communication, which is empirically observed through their higher frequency in CDS (as compared to other samples of adult language) has the effects that act in the same direction as the distributional factors of acquisition (higher frequency in child speech). On the other hand, despite its pragmatic relevance and higher frequency in CDS, the preposition *sa* does not occur in the speech of the youngest children. Thus, it follows that structural complexity (homonymy of the preposition *sa*) and related cognitive limitations lessen the effects both of pragmatic and general distributional factors.

Such an analysis defined the determinants of the development of the prepositional system (frequency in input, pragmatic relevance, conceptual complexity, complexity of language structure), as well as the effects and modalities of their action (the effects on the prepositions *kod* and *sa*; modalities: alleviating and inhibiting effects). It should be noted that in an analysis of the distribution of prepositions in language, the impact of different factors is not evident to the same extent; rather, their effects can and must be monitored by different methodology. Pragmatic relevance is always reflected in the frequency of prepositions in CDS and/or child speech, so that it can be used in statistical and correlation analyses. On the other hand, the key aspects of the conceptual complexity and complexity of language structure can hardly be expressed in quantitative terms. Thus, they need undergo a qualitative analysis. It anticipates the comparison of the conceptual/structural complexity of prepositions with the child's assimilative readiness to acquire them at a specified stage of development.

It should be noted that the nature of developmental factors is often crucial for understanding the mechanisms of their influence. The influence of distributional factors (frequency) can be explained by elementary associative learning. Frequency in itself is of a non-linguistic and non-conceptual nature; it only shows the rate of occurrence of an event and says nothing about the nature of the event itself. Therefore, it must be emphasized that the impact of the frequency of language structure is independent of the content of that language structure, so that the mechanism of its impact must be of a precognitive nature.

According to our data, as well as according to the interpretation of the representatives of a distributional approach (Lieven, Pine & Baldwin, 1997; Lieven, Behrens, Speares & Tomasello, 2003), these elementary forms of learning are characteristic of the initial stages of language development. But in the later stages there are also the factors whose effects are produced by initiating higher cognitive processes (conceptual development). The following examples will illustrate the possible qualitative analysis of the factors and mechanisms of their effects.

QUALITATIVE ANALYSIS OF SPECIFIED SAMPLES OF PREPOSITION USE

Corpus searching enables us to gain an insight not only into the preposition probabilities, but also into some qualitative characteristics of their distribution in a semantic and syntactic sense.

At the earliest age, the first prepositions occur within two-word utterances, most frequently preceding only one noun ("*u kuću*" /»to the house«/; «*u školicu* (*školicu*)» /»to school«/; «*kod Miće*» /»with Mića«/; "*sa tatom*" /»with daddy«/). Later on, this construction is expanded by the verb ("*ide u vikec* (*rikverc*)" /»driving backward«/; "*otiš'o u Nemačku*" /»went to Germany«/; "*da staviš na glavu*" /»to put it on the head«/). The child's vocabulary is limited, so that the number of nouns used together with the preposition is also limited and the same combinations are frequently repeated.

The noncongruent preposition-noun combinations are rare even in the earliest speech. These data, which can also be found in other child speech studies (Jocić, 1980-1981; Kostić & Vladislavljević, 1995), are interesting, because they can be interpreted in the spirit of nativism. The number of possible incongruent preposition-case combinations and the possibility that the child makes an error are great, but the number of such errors in children's spontaneous speech is small. This points to the child's pronounced sensitivity to language »input« from its environment and its receptiveness to it even when there are no cognitive preconditions for that.

At an older age (2;8 and 3;2), when prepositions begin to be used in the context of the whole sentence, i.e. when the prepositional-case phrase is used together with the verb, one can observe the use of the preposition together with the noun, in the case which is congruent, but does not correspond to the context of the sentence. For example, in the sentence: «*Ide sad u škoi* /*školi*» /»Go now to school«/, the dynamic state verb *go* requires a noun in accusative to indicate the purpose of movement, but in this case the locative is used instead, thus giving an inadequate positional meaning to that syntagm. Such substitutions (acusative/locative and locative/acusative) were observed in the case of the preposition *u*, which requires the accusative when used with dynamic state verbs and the locative when used with static state verbs. It would be interesting to find out whether the preposition-noun combinations, which are not adequately used by the child (overgeneralized), are more frequent in the sample of adult speech directed to it⁵. Should it be the case, that would be an argument in favour of the assumption that the meaning of the preposition is acquired together with the noun and that at the

⁵ For example, whether the child could hear the combination *u školi* (at school) more frequently than *u školu* (to school).

beginning they make up a whole. With the acquisition of new words and new combinations with the preposition, the meaning of the preposition begins to be differentiated. In a cognitive sense, the preposition determines the meaning of the noun more precisely for the child. As we have already mentioned, more recent studies show that certain fragments of speech are acquired as a whole and that they are segmented into their grammatical and lexical components later on (Lieven, Pine & Baldwin, 1997; Lieven, Behrens, Speares & Tomasello, 2003). That would be an argument in favour of the view that at the beginning of language acquisition the frequency of words from the sample to which the child is exposed, represents one of the major factors influencing the first occurrence of a word, and when it happens, the development of its meaning continues through its use in different combinations and contexts, both syntactic and semantic.

The following samples from corpus also support the view that the child acquires certain segments of speech as «frozen» units or, in other words, as associatively related pairs.

The girl aged 3;8 (*ANA) is viewing a photo album together with an adult person (*BIL). In order to facilitate the monitoring of the lexical and structural characteristics of the child's utterances, the critical parts of the continuing dialogue are presented in a tabular form. Utterances are given in the original form (in Serbian), the lines marked with %eng contain the English translation of the utterances, while the lines marked with %lmm contain the basic form of the word (entry, lemma).

1. *BIL:jao, a ko je ovo?

%eng: oh, and who is this?

%gpx: showing ANA a photograph

2. *ANA:	ma	ja	na	moru
%lmm:	well	I	at	seaside
%eng:	well, me at the seaside			

3. *BIL:ma kako znaš da si ti ovo?

%eng: but how do you know it's you?

%gpx: still showing the same photograph

5. *ANA: pa znam zato što imam ovo.

%eng: well I know because I have this

%gpx: points to something on the photograph

6. *BIL: a šta je to?

%eng: and what is it?

7.*ANA:	pa	ono	<i>od</i>	<i>na+mora*</i>	to.
%lmm:	well	that	<i>from</i>	<i>at+seaside*</i>	this
%eng:	*well, that's <i>from at</i> the seaside.				

%act: looking back at the album

8. *BIL:hm.

%com: confirmation

9. *ANA:	tako	se	uradi	<i>na+more.</i>
:lmm:	so	do		<i>at+seaside</i>
%eng:	that's how it is done at the seaside.			

%com: that is the swimming belt or something like that.

The use of the prepositional-case phrase *na moru* (at the seaside) in Utterance 2 seems to be absolutely adequate, but non-grammatical Utterance 7 (marked with an asterisk) sheds a new light on the use of this prepositional-case syntagm. Through this utterance, it is becoming evident that the child treats the preposition *na* and the noun *more* as one lexeme. In Utterance 7 she also used the preposition *od* (from, of, by) next to it, whereby this word was given in the appropriate case, genitive. This confirms that the child uses *namore* as a single noun. In Utterance 9, the status of the critical word can be interpreted in two ways: (a) as a prepositional-case syntagm in the adverbial function, or (b) or as the adverb of place. The example shows the variability of the semantic and syntactic status of the word during development and the extent to which the context of a word represents both a limitation and support for building its meaning.

«Frozen» units represent the initial phase of word acquisition. They provide a basis for the beginning of building and expanding the meaning of each word making up that unit. In addition to the child's increasing language experience and cognitive maturity, the establishment of the multi-word structure is also contributed by the child's possibility to hear each of those words in different syntactic and semantic combinations and contexts. The child begins better to observe and differentiate the relations in the world around it and becomes capable of express some of them through language as well. The initial lexicon and, within it, these phrases, which are not multi-word ones, serve as «islands of organization» (Lieven, Pine & Baldwin, 1997) which will - in different combinations with the already acquired and new words – provide a basis for building and differentiating the meaning of words mark the beginning of establishing some of those meanings. The development of their

meaning will last for a rather long time. At least until the sixth year of age when prepositions are in question (Anđelković, 1997; 2000a; 2000b).

In the children's corpus there is a very illustrative example how a child with the help of its mother is trying to differentiate the meaning of the preposition it is currently acquiring. This is the preposition *do* (up to, to, by, next to) which, in the speech of the child of that age, occurs with frequency 3. Two occurrences form part of the nursery rhyme: "*od srede do petka*" («from Wednesday to Friday»), "*suknjica mi do veza (instead of «od veza»)*", («my skirt is up to embroidery», /instead of «with embroidery») whereby this other use is actually the use of the lexeme *do* which, according to phonemes included, substituted the preposition *od*. These two examples show that the child possesses the lexeme *do*, but has not mastered its meaning. The only productive use (outside the quotation) of the preposition *do* (see Utterance 2 below), is within the prepositional-case phrase she is repeating immediately after her mother (Utterance 1). In the following example, the girl is trying to acquire the meaning of the preposition *do* by means of the prepositions *kod* and *na* she is already using independently in her speech.

1. *MAJ: jao, bićete veliki ti i medo, do tavana, gore.

%eng: wow, you and teddy bear will be big, up to the attic.

%gpx: pointing upwards

2. *ANA:	ja	i	medo	biti	<u>do</u>	<u>tavana</u>
Imm:	I	and	teddy bear	be	<i>up to</i>	<i>attic</i>
%eng:	me and teddy bear be up to the attic					

3. *MAJ: ti ćeš biti do tavana, da.

%eng: you will be (tall) up to the attic, yes.

4. *ANA:	ja	i	medo	biti	<u>ko(d)</u>	<u>tavana</u>
Imm:	I	and	teddy bear	be	<i>near</i>	<i>attic</i>
%eng:	me and teddy bear be near the attic					

5. *MAJ: i medo će bit(i) do tavana, hoće, ljubavi.

%eng: and the teddy bear will be (tall) up to the attic, he will, my love.

6. *MAJ: mhm.

%com: affirmation

7. *ANA:	<u>na</u>	<u>flapone*</u>
%Imm:	<i>on</i>	<i>cieling</i>

%eng:	on the <i>cieling*</i> (incongruent)
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%exp: the word „*cieling*“ is abbreviated not only morphologically, but also phonologically.

8. *MAJ: šta kažeš?

%eng: what did you say?

9 *ANA:	<i>na</i>	<i>fafone*</i> .
%lmm	<i>on</i>	<i>cieling</i>
%eng:	on the <i>cieling*</i> (incongruent)	

%com: the word „*cieling*“ abbreviated again

10.*MAJ: *do plafona*, da.

%eng: to the *cieling*, yes

11.*MAJ: *na plafone**.

%eng: on the *cieling**.

%com: repeating the child's irregular construction „*na plafone*“ instead of „*do plafona*“.

12. ANA:	<i>gole!</i>
%eng:	up

%gpx: pointing upwards

13. *MAJ: *na plafonu*, gore.

%eng: on the ceiling, up

%gpx: pointing upwards

14. ANA:	<i>visoko!</i>
%eng:	high

%gpx: pointing upwards

15. *MAJ: visoko *do tavana*.

%eng: high to the ceiling

%gpx: pointing upwards

16. ANA:	<i>visoko</i> ,	tamo,	<i>gore!</i>
%eng:	high, there, up		

The child reformulates the meaning of the preposition *do* used by the mother in utterance 1 to indicate extension, reaching (*up to the attic*) by means of the preposition *kod* (Utterance 4, *kod tavana /near the attic/*), which expresses some more general spatial relationship. The child then changes the critical prepositional-case syntagm by means of the preposition *na*, as well as by introducing the new noun having a similar meaning (Utterance 7), *na flapone* (meaning the noun *plafon*, ceiling). It is interesting to note that the substitution at this place (Utterance 7) is carried out at four levels:

1. The substitution of the preposition *do* for the preposition *na*:

In this situation, the preposition *na* is semantically more distant from the meaning referred to in the mother's utterances (1, 3, 5). However, it is more precise in a spatial sense, because it refers exactly to the place, as opposed to the prepositions *do* and *kod*, which refer to a broader spatial zone;

2. The substitution of the noun *tavan* (attic) for the noun *plafon* (ceiling):

The noun is associatively and semantically related, so that it is not unusual that it occurred here;

3. The change of the case form of the noun:

Instead of the genitive singular *do plafona* (*up to the ceiling*) the preposition *na* is used accompanied with the form *flapone* (*plafone*) which grammatical status can be interpreted as the accusative plural (highly unlikely, because the plural in this case is not semantically meaningful), or as some irregular form of the accusative singular, having a diffuse meaning, which can otherwise be observed in children when acquiring Serbian (Radulović, 1975; Jocić, 1980-1981; Kostić & Vladislavljević, 1995);

4. A change in the phonological structure of the noun:

Instead of *plafone*, the pronunciation was *flapone*; however, the phonological change is not relevant to our research, so that it will not be dealt with.

With the help of her mother, who is following these reformulations by repeating them and supplementing them with a correct prepositional-case phrase, the girl rounds off her understanding of these relations by the adverbs *gore* (up) and *visoko* (high) which, in part, include and supplement the previously used prepositions semantically. It is interesting to note that after the mother's first effort (Utterance 10) to correct the child's construction (from *na flapone* to *do plafona*), the child did not accept that. She is looking for a new solution in the words *gore* and *visoko*, which is probably the result and indicator of her insufficient mastery over

the prepositional-case phrase and all of its aspects (functions and meanings, congruence, syntactic distribution).

The child's repeated efforts to express one meaning by testing different, already learned and semantically related constructions, reflect the learning mechanism that must be of a higher cognitive nature. What occurred in this sequence cannot be described by elementary associative mechanisms of a precognitive nature.

DISCUSSION

In this study we made a more detailed analysis of the distribution of prepositions and learned that *kod* and *sa* were the prepositions which, at the earliest age, deviated the most from the predictions based on the distribution in adult language. An analysis of the developmental factors provided an explanation for their deviation. Being pragmatically relevant to the specificity of child-adult communication, both prepositions are highly frequent in child-directed speech (twice as frequent in comparison with adults' discourse language, and even 18 times more frequent in comparison with written language). In the case of the preposition *kod*, its high frequency in CDS is reflected in its early acquisition and high frequency in child speech. In the case of the preposition *sa*, however, its high frequency in CDS is hindered by the linguistic complexity of that preposition, that is, its homonymous nature.

As is known from the earlier studies devoted to the development of the prepositional system (Rice, 1999; Savić & Anđelković, 2005, in preparation), distributional factors are crucial for acquisition. The results of this study also contribute to the elucidation of the role of other factors, such as: pragmatic relevance, conceptual complexity and structural complexity.

The analysis of the *nature* of the factors relevant to the acquisition of prepositions also enables, at least in part, the elucidation of the mechanisms of development: elementary associative learning in the earlier stages and, in the later ones, the appliance of one language structure in a different syntactic and semantic context, as well as the application of different language structures to the same semantic context. The latter mechanism anticipates the inclusion of higher cognitive processes, as well as a long, perennial learning how to gain mastery over the prepositional system.

The problem of developing the meanings of prepositions can also be formulated in terms of Eva Clark's thesis about the acquisition of semantic traits (1981). The thesis about the acquisition of semantic traits suggests that, at the beginning, the child does not know the full meaning of words and that they correspond to those from adults' vocabulary only with respect to some traits

(components of the meaning). According to Clark (1981), the development and acquisition of semantic knowledge would consist in adding new traits to the meaning of the word until the combination of the traits for that noun coincides with its meaning for adults. Consequently, the child would know only some traits of meaning of the prepositions in its language, but they would be expanded and supplemented through use, so that at the age of six (probably), they would coincide with the meanings of the prepositions for adults in a semantic sense.

In our view, Clark's thesis does not contradict a distributional approach; rather, they complement each other. The novelty offered by a distributional approach is the knowledge how the child acquires the sign (word). Namely, the child's sensitivity to the statistical properties of language «input» to which it is exposed, i.e. its probability, is the way in which it can find the words required for the initial communication with adults, whereby frequency is the indicator of their presence and relevance in communication. When the child acquires those first words which, in a semantic sense, do not coincide with those of adults, there begin the building and differentiation of their meanings through use in a different syntactic and semantic context. The limited semantic field which, at the beginning, was covered by a few prepositions, is expanding and being mapped by means of an increasing number of prepositions, until it becomes equalized with those in adult language. In that sense, we can also refer to Vigotski's thesis (1983) that the development of the meaning of a word begins only with the first use of that word and that understanding is a very long process, which lasts until adolescence. This idea was impressively formulated by Vigotski (1983) arguing that the syntax of language precedes the syntax of thought.

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Appendix 1. Proportion of prepositions from the children's corpus (by age) and samples of written language, CDS and discourse language

Preposition	1;8 prop	2;2 prop	2;8 prop	3;2 prop	3;8 prop	written	CDS	discourse
U	0,4615	0,3613	0,3579	0,3295	0,2468	0,3261	0,2617	0,3289
Na	0,1923	0,1806	0,2105	0,1506	0,2010	0,1634	0,2018	0,1655
s(a)	0	0,0581	0,0895	0,1392	0,1323	0,0925	0,1571	0,0928
Od	0	0,0452	0,0474	0,1335	0,1272	0,0790	0,0682	0,0611
Za	0,1154	0,0387	0,1316	0,0852	0,1043	0,1034	0,0964	0,0796
Kod	0,1538	0,1806	0,0895	0,0682	0,0356	0,0072	0,0922	0,0606
Po	0	0,0387	0,0421	0,0142	0,0916	0,0285	0,0296	0,0232
Iz	0	0,0065	0,0053	0,0227	0,0178	0,0071	0,0222	0,0364
Do	0	0,0194	0,0105	0,0284	0,0025	0,0288	0,0103	0,0395
Pored	0	0,0323	0	0,0085	0,0127	0,0045	0,0068	0,0011
Iza	0	0,0065	0	0,0028	0,0076	0,0042	0,0049	0,0005
Preko	0,0385	0,0065	0,0053	0,0057	0	0,0091	0,0039	0,0074
Bez	0	0,0065	0,0105	0	0,0051	0,0213	0,0068	0,0142
Okolo	0,0385	0,0065	0	0,0028	0	0,0068	0,0037	0,0121
Ispred	0	0,0065	0	0,0028	0	0,0011	0,0025	0,0016
Ispod	0	0	0	0	0,0051	0,0042	0,0051	0,0026
Kroz	0	0	0	0,0028	0,0025	0,0165	0,0054	0,0090
O	0	0	0	0,0028	0,0025	0,0317	0,0084	0,0211
Pokraj	0	0,0065	0	0	0	0,0009	0,0002	0
u sred	0	0	0	0	0,0025	0,0015	0,0002	0
Kraj	0	0	0	0	0,0025	0,0064	0,0008	0,0005
Σ	1	1	1	1	1	1	1	1

REZIME

USVAJANJE PREDLOŠKOG SISTEMA: PROBLEM FAKTORA I MEHANIZAMA RAZVOJA

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U radu se polazi od rezultata ranijih istraživanja da su distributivne karakteristike (frekvencija) jezičkog inputa ključne za usvajanje predloškog sistema. Analiziraju se odstupanja u distribuciji predloga u spontanom dečjem govoru od predikcije dobijene na osnovu distribucije u jeziku odraslih. Dobijeni rezultati pokazuju da u poređenju sa odraslima odstupaju samo predlozi «kod» i «sa». Ustanovljeno je da neočekivano rana i učestala upotreba predloga «kod» u dečjem govoru potiče od učestale upotrebe istog predloga u govoru odraslih upućenom deci. Suprotno tome, predloga «sa», iako visoko frekventan u govoru odraslih upućenom deci, ne pojavljuje se u govoru dece na najmlađim uzrastima, jer ga njegova homonimnost čini kognitivno složenim. Analiza uzroka odstupanja je dala osnove za diskusiju o mogućim faktorima i mehanizmima razvoja: distributivne karakteristike jezika odraslih su ključni faktor usvajanja, ali su registrovani i lokalizovani efekti konceptualne i jezičko-strukturne složenosti.

Ključne reči: razvoj govora, predlozi, distribucija, korpus, dečji govor, govor upućen deci