PROCEEDINGS OF THE
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CONFERENCE

EMPIRICAL STUDIES IN PSYCHOLOGY

MARCH 24-26, 2017
FACULTY OF PHILOSOPHY, UNIVERSITY OF BELGRADE

INSTITUTE OF PSYCHOLOGY
LABORATORY FOR EXPERIMENTAL PSYCHOLOGY
FACULTY OF PHILOSOPHY, UNIVERSITY OF BELGRADE

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QUANTITATIVE INDICATIONS OF CHANGE IN EARLY SERBIAN LANGUAGE PRODUCTION[1]

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The study is an exploration of quantitative indicators of the growth of spontaneous language production of eight children longitudinally recorded at 16 age levels from 18-48 months of age. The interaction sequences were transcribed and compiled in the Serbian Corpus of Early Child Langauge. The study is focused on the usage of words and utterances, vocabulary size, lexical diversity, and the length of utterance. The aim was to retrieve information on the average performance of children and variation on each measure and to compare them across ages. The findings revealed significant increase across age on all quantitative indications. Differences among children are explored and a preliminary estimation of the levels of language productivity and growth was made. The individual profiles are compared, so advanced and slower children are identified in the corpus.

Keywords: child language, Serbian language, vocabulary size, lexical diversity, Mean Length of Utterance

Introduction

Research on language acquisition is very often dependent on data compiled in corpora of child language. Even though extremely time-consuming for building, corpora are often unreliable for being collected on a limited sample of children and in naturalistic contexts susceptible to all kinds of situational and pragmatic variability. It is therefore recommended to make a detailed examination of a corpus to be worked on, as an opportunity to acquaint with positive and negative properties of the sample.

The study is a preliminary exploration of the quantitative indications of language development of the sample of children included in the *Serbian Corpus of Early Child Language (SCECL)* (Anđelković, Ševa & Moskovljević, 2001) in *The CHILDES* database (MacWhinney, 2000). The analysis was conducted on transcripts of children's production and aimed at the computation of commonly used basic measures of lexical and syntactic development: production of words, vocabulary size, lexical diversity, production of

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utterances, mean length of utterance and deviation in the mean length of utterance. The aim was to retrieve information on the average performance of children and variation on each measure and to compare them across ages. Differences among children are explored and individual profiles compared in order to make a preliminary estimation of the levels of language productivity and growth.

Method

Sample

The *SCECL* contains the transcripts of spontaneous verbal production of eight children longitudinally recorded at 16 age levels (18-48 months). The corpus underwent an automatic lemmatization based on *The Frequency Dictionary of Contemporary Serbian Language* (Kostić, 1999; Ilić & Kostić, 2002), with an additional manual check of the children's production and standardization of the words deviating from the conventional phonological form. The target of our analysis were words and predicative utterances, so we excluded unanalyzed expressions like children's rhymes, curse words, exclamations, onomatopoeia, vocalizations, and other unintended and unconventional vocal emissions.

Variables

The following quantitative indicators of lexical development in child language were monitored: the overall number of words produced as an indication of general productivity (Tokens), the number of different words as a measure of vocabulary size (Types), and Type/Token Ratio (TTR) as a measure of the use of vocabulary items - lexical diversity. The TTR index is considerably dependent on the number of hapaxes, i.e. the words that occur only once in a corpus, so it is often used as an indication of the occurrence of lexical novelties in a child language sample. It is negatively represented by its numerical value – the smaller TTR index indicates the larger lexical diversity. In addition, a negative non-linear relationship between TTR and sample size was found (Richards, 1987), so the index of TTR weighted by the number of tokens (TTR/tokens) was calculated instead, as a way of index standardization.

In the domain of utterance production, the number of utterances was retrieved, the Mean Lenght of Utterance as a measure of syntactic ability calculated in words (MLUw), and the standard deviation of MLUw as an indication of a child's ability to construct prolonged utterances (SD.MLUw). The findings of previous studies (Hickey, 1991; Malakoff, Mayes,

Schottenfeld, & Howell, 1999; Parker & Brorson, 2005) show that the MLUw is highly correlated (0.97-0.99) with its classic counterpart the Mean Lenght of Utterance calculated in morphemes (MLUm) suggested earlier by Brown (1973). Since defining morphemes in morphologically complex Slavic languages is a demanding and time-consuming task, we opted for MLUw as a reliable measure of child language development.

Data analysis

All the measures are calculated for all 16 age levels (8-48 months) compiled in the *SCECL* corpus. Comparisons between age levels and individual children are made. A preliminary inspection of individual and group verbal production revealed more intensive developmental changes in the earlier age levels than later on, so regression analysis with the function of logarithmic type was systematically applied.

Results

The analysis showed a statistically significant change in all selected indicators of language development as presented below.

The overall production of words (Figure 1) significantly increased with age: R^2 = .899, $F(1,14) = 125.303$, $p < .01$. The number of word types as an indication of vocabulary size (Figure 2) also increased significantly: $R^2 = .908$, $F(1,14) = 138.505$, $p < .01$.

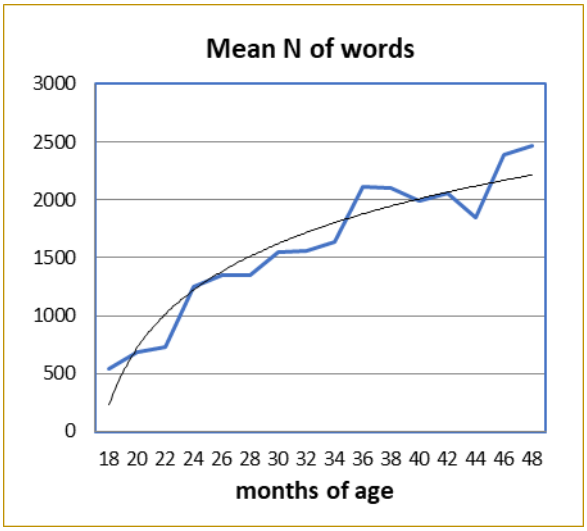

Figure 1. The overall production of words across age

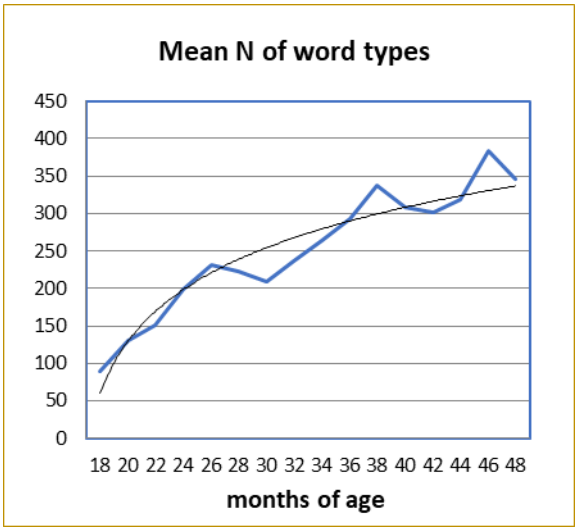

Figure 2. The increase in vocabulary size across age

A significant decrease in Type/Token Ratio weighted by sample size (TTR/token) reveals the distribution of the usage of vocabulary items across age (Figure 3): R^2 = .862, $F(1,14)$ = 87.449, p < .01. It provides an evidence of increased lexical diversity, i.e. appending of new coming words into the children's vocabulary.

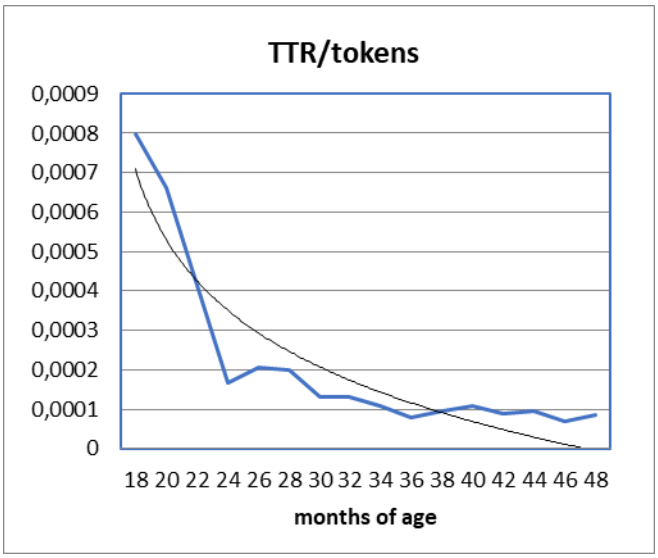

Figure 3. The decrease of TTR/tokens as an indication of the increase in lexical diversity

The production of utterances was also calculated across 16 ages levels. The increase in the average number of utterances produced by children is statistically significant: R^2 = .8458, $F(1,14)$ = 76.79, p <. 01 (Figure 4). The increase of the Mean Lenght of Utterance in words (MLU_W) across age was also significant (Figure 5): R^2 = .9589, $F(1,14)$ = 326.63, p < .01, as well as the increase of the Standard Deviation of Lenght of Utterance (SD.MLUw) (Figure 6): R^2 = .9352, $F(1,14)$ = 202.049, p < .01.

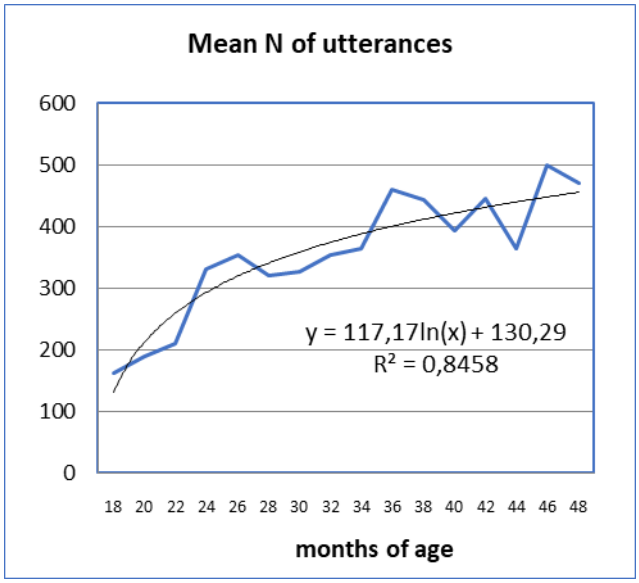

Figure 4. The average number of utterances produced by children at different age levels

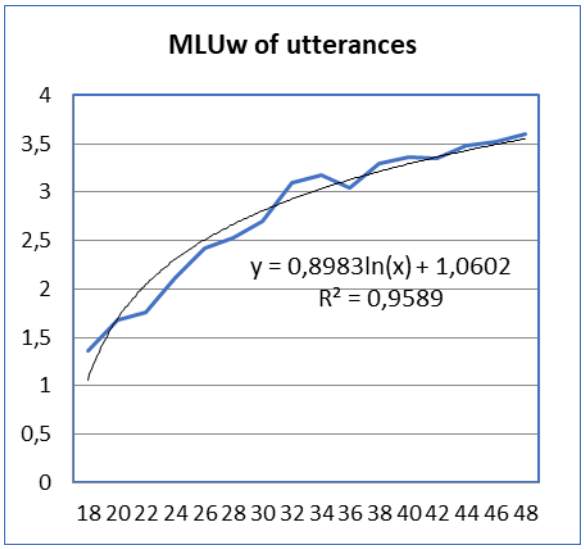

Figure 5. The Mean Lenght of Utterance in words (MLU_W) across age

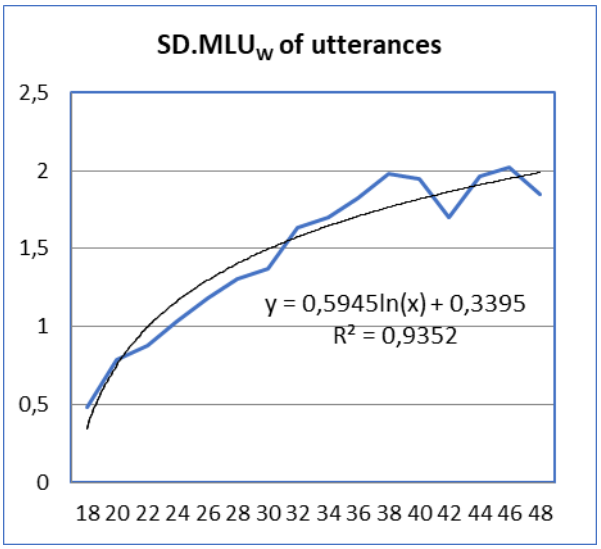

Figure 6. The Standard Deviation of MLUw (SD.MLUw) across age

Growth in the language production of individual children

More detailed exploration of the curves of individual improvement revealed rather large variety across age levels, as illustrated by the increase in vocabulary size (Figure 7), and the increase in the length of utterance (Figure 8).

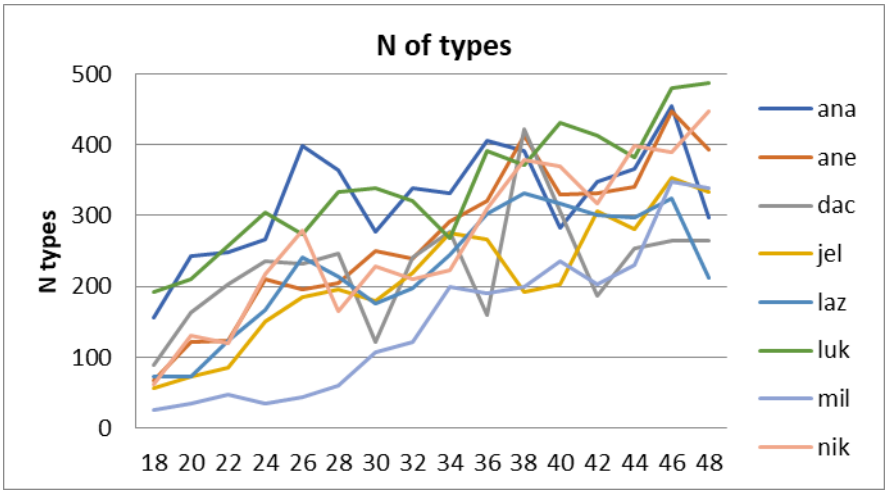

Figure 7. The curves of individual improvement in vocabulary size across age

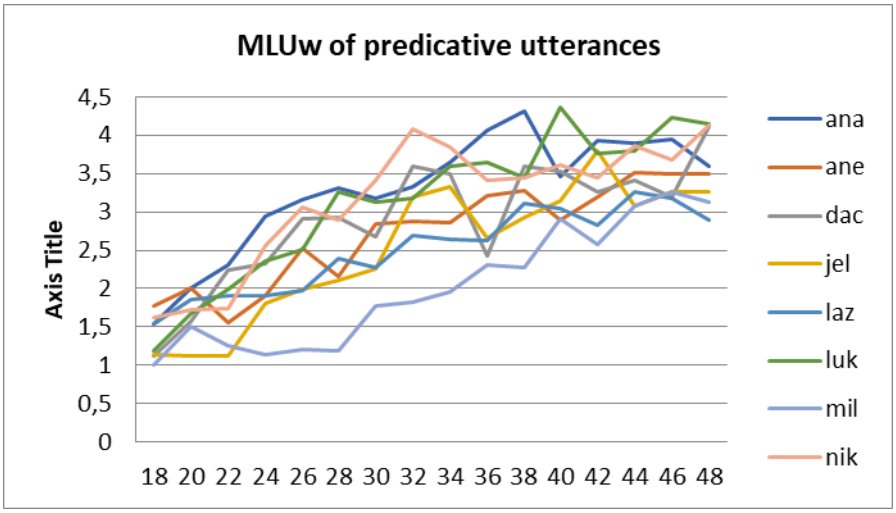

Figure 8. The curves of individual improvement in the length of utterance

Variety in the individual curves across age was also found in all quantitative indications. So, it must be taken into consideration when using the *SCECL* corpus in a research, and an estimation of developmental progress of individual children are to be made.

For the purpose of comparisons between the children, the individual profiles at different indications of change are presented (Figure 9). It should be mentioned that five out six indicators are positively represented by their numerical values (high index reveals high

performance). Only the measure of lexical diversity (TTR/token) is negatively represented by its numeric (high performance is indicated by low index). In order to make it comparable with other measures, it was necessary to make an inversion of TTR/token index by multiplying with -1 (Lexical_diversity in the Fig. 9).

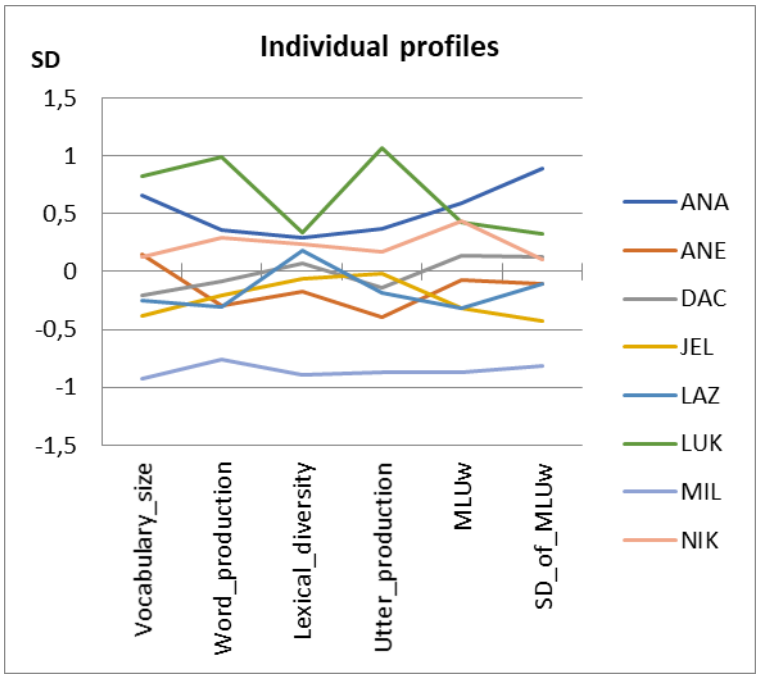

Figure 9. The individual profiles on six quantitative indications of developmental change

The preliminary language profiles obtained on the average of all age levels revealed that individual performances of children and their position in the peer group are rather stable across domains (Figure 9). LUK, ANA, and NIK with large vocabulary size have high performance in all indicators. DAC, JEL, LAZ and ANE are children around the average in all indicators. MIL production is systematically low, but his indexes do not deviate from the average more than 1SD.

Conclusion

Significant increase across age was recorded on all six measures of word and utterance production. Exploration of individual differences helped in identification of developmentally more advanced and slower children in the sample. On the other side, the varying rates of individual progression of a single child across age display the natural situational and pragmatic variability in the recording sessions. It is important to note that the vocabulary size is used here as an indication of the sample size (n of types) at different age levels in the corpus, which is surely an information important for an exploration of the

sample. However, from a developmental point of view, a better estimation of the natural growth in children's vocabulary would be an exploration of cumulative number of types, which takes into account cumulative effects of appending words in the usage. There are also other measures which could provide a better estimation of developmental change across age and they will be explored in the future studies.

References

Anđelković, D., Ševa, N. & Moskovljević, J. (2001). *The Serbian Corpus of Early Child Language.* Laboratory for Experimental Psychology, Faculty of Philosophy, and Department of General Linguistics, Faculty of Philology, University of Belgrade. http://childes.psy.cmu.edu/access/Slavic/Serbian/SCECL.html

Brown, R. 1973. *A first language: The early stages*. Cambridge, MA: Harvard University Press.

Hickey, T. (1991). Mean length of utterance and the acquisition of Irish. *Journal of Child Language, 3*, 553-569.

Ilić, N., & Kostić, A. (2002). Problem homografije pri automatskoj lematizaciji. *VIII Naučni skup Empirijska istrazivanja u psihologiji*. Knjiga rezimea, 36-37. Univerzitet u Beogradu.

Kostić, Đ. (1999). *The Frequency Dictionary of Contemporary Serbian Language*. Institut za eksperimentalnu fonetiku i patologiju govora, Beograd i Laboratorija za eksperimentalnu psihologiju, Filozofski fakultet, Univerzitet u Beogradu.

MacWhinney, B. (2000). *The CHILDES Project: Tools for analyzing talk.* Third Edition. Mahwah, NJ: Lawrence Erlbaum Associates.

Malakoff, M. E., Mayes, L. C., Schottenfeld, R. & Howell, S. (1999). Language production in 24-month-old inner-city children of cocain-and-other-drug-using mothers. *Journal and Applied Developmental Psychology, 20*, 159-180.

Parker, M., & Brorson, K., (2005). A comparative study between mean length of utterance in morphemes (MLUm) and mean length of utterance in words (MLUw). *First Language, 25* (3).

Richards, B. (1987). Type/Token Ratios: What do they really tell us? *Journal of Child Language, 14*, 201-209. doi10.1017/S0305000900012885

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