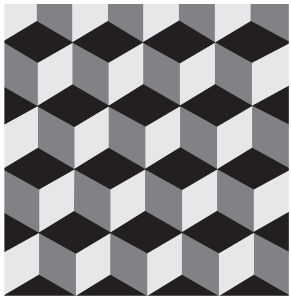

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VALIDATION OF THE INTERNATIONAL AFFECTIVE PICTURE SYSTEM (IAPS) IN SERBIA: COMPARISON OF A SERBIAN AND A HUNGARIAN SAMPLE[2]

The purpose of this study was to extend the International Affective Picture System to Serbia, which is worldwide workrelated to the ratings. A total of 158 students participated in the study, which included ninety Hungarian students and sixty-eight Serbian students. The participants were required to rate sixty pictures from the IAPS database on the dimensions of valence, arousal and dominance. One of our main aims was to compare the results from Serbia and the North American ratings. We found a significant group difference on the dimension of arousal between the North American and the Hungarian group. Additionally, we found differences between the two groups from Serbia: in Serbian and Hungarian students, as majority and minority groups, there were differences on a dimension arousal. The differences that were statistically significant in relation to the ratings from Hungary were the ones between the Hungarian group from Hungary and the North American ratings, as well as between the Hungarian group from Hungary and our Hungarian group, on the dominance dimension. Sex differences were also found significant regarding arousal and dominance. These differences were in line with other cross-cultural comparisons. We also correlated the results from the USA, Hungary, Bosnia, and our two subgroups, and we found the highest correlations between the two groups from Serbia. Based on the overall results we could conclude that the affective evaluations were similar in Serbia and in other countries, and that the IAPS database could be used for the research purposes in Serbia.

Keywords: emotional stimuli, IAPS, validation

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Introduction

The Relevance of Emotions and Emotional Stimuli in Psychological Research

In the past several years there has been a growing number of studies aimed at exploring emotions and affective processing (Kelberer, Kraines, & Wells, 2018; Schwager & Rothermund, 2013), as well as emotional stimuli (Bradley & Lang, 2007; Brosch, Pourtois, & Sander, 2010; Gong, Wong, & Wang, 2018). Emotionally charged stimuli "possess high relevance for the survival and well-being of the observer" (Brosch et al., 2010: 381). There are numerous studies that underpin the relevance of the research by using emotional stimuli: e.g., a recent one showed that optimism varies on an individual level with differences in attention to (negative) emotional stimuli, the former being a concept that is linked to emotional well-being in the everyday life (Kelberer et al., 2018).

As Uhrig et al. (2016: 1) stated: „There is a longstanding tradition in psychological research of trying to create emotional states in the laboratory for scientific aims." However, they also added that many of these brought about ethical or standardization difficulties. In order to overcome these problems, film clips, sounds or words with varying emotional content have been used as emotion eliciting stimuli in many experimental designs' pictures (Bradley & Lang, 2000; Gilman et al., 2017; Kurdi, Lozano, & Banaji, 2017). Pictures differ from movie clips in the fact that they are static in nature, but they have all the other visual characteristics as movies in depicting a scene. Recent studies combine different kinds of emotion evocative stimuli (e.g., words and pictures, words and sounds, etc.) (e.g., Alčaković, Orlić, & Đurić, 2018; Fan et al., 2018; Orlić, 2012), thus norms on the emotional dimensions for the stimuli being used would provide a big methodological help. Picture databases can also differ from each other in showing various contents, and in our opinion there are two big categories of pictures: the ones in which we can see facial expressions (e.g., FACES: Ebner, Riediger, & Lindenberger, 2010), and the others, which use more diverse topics like animals, nature, objects, people, events (Bradley & Lang, 2007; Kurdi et al., 2017).

Previous studies have established that in the case of cross-cultural comparisons, researchers need to check the material they want to use for the cross-cultural consistency, or have country-specific norms for the same affective stimuli (Bradley & Lang, 2007). One of the most widely used and validated picture/photograph databases is the International Affective Picture System (IAPS) (Lang, Bradley, & Cuthbert, 2005), which has its normative ratings on the American sample. The aim of our study was to validate the IAPS in Serbia, and make a cross-cultural comparison with the American and Hungarian results from Hungary. We also compared a Hungarian minority group and a Serbian majority group from Serbia, coming from the same cultural background, but prone to varying emotional reactions. Our aim was to see whether there were differences between the groups.

This additional aim was important for us, because there were many studies dealing with and comparing Hungarian and Serbian respondents from Serbia. We also wanted to test the correlations with ratings from the American group and groups from the two neighbouring countries, Hungary and Bosnia, to check for cross-cultural stability.

Theoretical Background and Cross-Cultural Usage of the IAPS

In recent years, many studies have used the IAPS pictures/photographs (Alčaković et al., 2018; Lang et al., 2005; Orlić, 2012,), in the cultural contexts other than the American. As we have mentioned above, the pictures/photographs in this system depict various topics: people, animals, objects, scenes, and show different positive, negative or neutral contexts and settings (Bradley & Lang, 2007). They are used for studying reactions to affective material and cognitive processing in various cultural contexts.

The picture system relies on the theoretical assumption called the dimensional view of emotions (Bradley & Lang, 1994, 2007; Osgood, Suci, & Tannenbaum, 1957). The main idea here is that the emotional world can be accounted for by determining the values on two to three dimensions: valence, arousal, and dominance (the latter is sometimes omitted as the third dimension) (Barrett, 1998; Bradley & Lang, 2007; Russell, 2003). Thus, the dimensional view does not work with basic emotion categories, but with values on the respective dimensions (Brosch et al., 2010). According to this view, all emotional events and experiences can be described by combining values of these (two or) three dimensions (Bradley & Lang, 2007; Lang et al., 2005). The meanings of the three dimensions are the following: valence is the quality of the emotional experience, arousal shows its intensity, and dominance refers to the perceived subjective control over the experience.

The International Affective Picture System (Lang et al., 2005) has been tested in many countries worldwide. Normative ratings for the IAPS have been established for numerous languages and cultures so far, including Flemish (Verschuere, Crombez, & Coster, 2001), Spanish (Moltó et al., 1999), Brazilian (Lasaitis, Ribeiro, & Bueno, 2008), German (Grühn & Scheibe, 2008), Chilean (Dufey, Fernández, & Mayol, 2011; Silva, 2011), Hungarian (Deák, 2011; Deák, Csenki, & Révész, 2010), Indian (Lohani, Gupta, & Srinivasan, 2013), Bosnian (Drače, Efendić, Kusturica, & Landžo, 2013), and European Portuguese (Soares et al., 2015). These studies vary in the sample size, the rated number of pictures, the used picture sets, the testing procedure, and the dimensions on which the ratings have been done.

In this research we decided to follow the work of Verschuere et al. (2001), because they selected pictures which were good representatives of the affective space, and because the subjects rated a smaller number of pictures in most of the previous studies. This last detail is mainly important due to the limited capacity of the attention functioning and fatigue (Lasaitis et al., 2008). Many of the above

mentioned studies found cross-cultural differences in the ratings of the pictures. We have reviewed these differences in the following section.

Arousal ratings were higher in the Chilean sample than in the American sample when the ratings were done only on valence and arousal dimensions (Dufey et al., 2011). Silva (2011) reported that when the ratings for different pictures were checked, lower arousal scores were found in the Chilean sample in comparison to the American one. In Bosnia and Herzegovina, Drače et al. (2013) found higher arousal ratings than the ones reported for the North America. Soares et al. (2015) found higher arousal levels for European Portuguese participants in comparison to the American results. This was also the case in Lasaitis et al. (2008) study and Lohani et al. (2013) study conducted with Brazilian and Indian participants.

Dominance levels were lower in the Flemish sample than in the ratings of the sample from the North America (Verschuere et al., 2001), but higher in the Hungarian sample (Deák, 2011; Deák et al., 2010), the Chilean sample (Silva, 2011) and the Indian sample (Lohani et al., 2013). Soares et al. (2015) found that dominance ratings of the European Portuguese participants were lower than those of the American participants, and this was also the case with Brazilian research participants (Lasaitis et al., 2008). These results implied that the valence/pleasure dimension seemed to be a cross-culturally more stable one, since few studies found variation in this respect. Only the research of Soares et al. (2015) showed lower levels of hedonic quality ratings in the European Portuguese participants in comparison to the American ones. It appeared that the dimensions of arousal and dominance were more prone to cultural specificity and change in values across cultures and nations than the dimension of valence.

Current Study: Validating the IAPS in Serbia

The main objective of our research was to test whether the pictures/photographs from the IAPS database could be used in a similar manner in Serbia as in the other countries. We wanted to establish whether there were cultural differences between the Serbian and American results, and whether sex differences would emerge in the results of the respondents from Serbia. Additionally, we wanted to compare two groups speaking the same language, Hungarian, but from dissimilar cultural backgrounds. We used the ratings from a majority Hungarian group living in Hungary and compared them to the answers of our minority Hungarian group living in Serbia. We also had an exploratory aim: we wanted to compare the assessments of the three dimensions in the Serbian group and the Hungarian group from Serbia. Majority and minority group status could affect emotional functioning (Gross & John, 2003): members of minority groups sometimes controled the expression of emotions. We also hypothesized that the members of our minority group might develop a bicultural identity (assimilate both to the Serbian majority country and norms and expectations and effects of the Hungarian culture from Hungary). This aim also had practical implications: the ratings on the pictures

could serve as a baseline for other studies, while similarities and dissimilarities could advance stimuli selection in future studies. We assumed that if there had been differences, then they would have been found on the arousal and dominance dimensions, since these dimensions showed variability in studies conducted so far. Lastly, we wanted to demonstrate the cross-cultural validity of our results by testing the correlations between the ratings from the American group, other neighbouring countries, Hungary, Bosnia, and our results.

Method

Participants

Ninety Hungarian-speaking students and sixty-eight Serbian-speaking students participated in the study in Subotica, Serbia. Hungarian language was the mother tongue in the Hungarian group. These students went to school with instructions in their native language. Serbian language was the mother tongue and the language of instruction in the Serbian group. The participants were enrolled at the University of Novi Sad, Hungarian Language Teacher Training Faculty, Academy of Arts and the Subotica Tech – College of Applied Sciences. In the Hungarian group, there were forty male and fifty female participants. In the Serbian group, there were forty-five male members and twenty-three female members. The age range of the participants was between 19-21. The study was run in nine small groups in three institutions, where students were grouped by their year of study and group membership in theoretical and practical classes. Accordingly, the two groups from Serbia had partly shared cultural background, but somewhat different linguistic backgrounds.

Stimuli and Measures

The study used the same pictures from the IAPS database as Verschuere et al. (2001), which were also used in Deák et al. (2010)[3]. These pictures were selected by Verschuere et al. (2001) because they could be grouped into 27 strata to represent all possible combinations of valence, arousal and dominance levels (mean results on a 9-point scale), with combinations of low ($x < 4$), average ($4 \leq x \leq 6$) and high ($x > 6$) levels of valence, arousal and dominance. Although Deák et al. (2010) used a larger number of pictures ($n = 239$), we decided to follow the work of Verschuere et al. (2001), because Deák et al. (2010) divided their pictures into sets, and their larger number of pictures subsumed the pictures from Verschuere

[3] The following pictures were used: 1090, 1201, 1390, 1463, 1601, 1660, 1710, 1740, 1812, 2030, 2080, 2110, 2190, 2391, 2520, 2620, 2751, 2752, 2890, 3100, 3190, 3280, 3350, 3530, 4532, 4598, 4652, 4669, 4770, 5260, 5460, 5532, 5533, 5594, 5750, 5760, 6010, 6540, 6570, 7010, 7030, 7060, 7150, 7190, 7200, 7235, 7260, 7360, 7560, 7640, 8021, 8300, 8400, 8461, 8540, 9140, 9330, 9411, 9432, 9571, 9600, 9620.

et al. (2001). We used a paper-and-pencil version of the Self-Assessment Manikin Graphic Rating Scale (Lang et al., 2005). Each scale had verbal labels to help the interpretation procedure of the scale, like in Deák's rating procedure (Deák, 2011).

Procedure

The study closely followed the procedure of Verschuere et al. (2001). Picture presentation was done by using Microsoft Power Point presentation software. The rating procedure was done in nine groups in the three institutions. They were formed relying on a preexisting schedule: as students come to theoretical and practical classes.

In the first step, oral instructions were given to the participants regarding the structure of the study and the rating task. They were acquainted with the way in which they were required to give the answers. Also, they were given a detailed explanation of the meaning of the dimensions. All this was followed by written instructions and participants were asked if they had questions. They signed an informed consent to participate in the study, and they were given two practice trials to check if they had fully understood all the instructions. Afterwards, the experimental part started. First, they were presented a slide for 5 seconds to get ready. Next, the picture to be rated was shown for 6 seconds, only once. This was followed by a slide that instructed the participants which page they should open in their booklets to give their answers. The participants were given 15 seconds to rate each picture on the three scales.

The pictograms and scales for giving the answers on the three dimensions were randomized, and the groups also saw randomized picture sets following the work of Bradley & Lang (2007). We had four picture orders, which were created by using a random number generator, and these were used in different groups (the picture order did not have a significant effect on the ratings). In the rating booklets, the number of the page corresponded to the number of the photograph shown, and the participants saw a warning slide, which showed the number of the page on which they had to rate the photograph.

Results

Reliability

The agreement between different measurements or reliability was tested in three ways: 1) by calculating the correlations between groups of participants who rated the pictures, 2) by calculating the split-half correlations using the data of participants with even and odd numbers, and 3) by using Cronbach's alpha. There were nine separate groups of participants who rated the pictures at different

times. In the Hungarian group, the Pearson correlations between the six groups on the valence dimension of the sixty rated pictures ranged between r = .89 - .97, p< .001. This means that there was a high positive correlation between groups on the rating of the valence dimension. On the arousal dimension, the correlation between various group ratings ranged between r = .74 - .90, p < .001, which indicated a high positive correlation. On the means of the dominance dimension, the association of the sixty pictures ranged between r = .81 - .93, p < .001, which was also a high positive correlation.

In the Serbian group, the Pearson correlations between the three groups on the valence dimension of the sixty rated pictures ranged between r = .91 - .97, p < .001. This means that there was a high positive correlation between groups on the rating of the valence dimension. On the arousal dimension, the correlation between various group ratings ranged between r = .73 - .84, p < .001, which indicated a high positive correlation. On the means of the dominance dimension, the association of the sixty pictures ranged between r = .78 - .90, p < .001, which was also a high positive correlation.

For the split-half correlation, we divided the Hungarian and the Serbian group of participants into two subgroups: one subgroup consisting of participants with an even number, and the other subgroup consisting of participants with an odd number. The Pearson correlations on the means of the pictures by dimensions are in Table 1 for the both groups.

Table 1
Correlations on the three dimensions by even and odd participants in both groups

		Even participants		
		Valence dimension	Arousal dimension	Dominance dimension
		Serbian/ Hungarian	Serbian/ Hungarian	Serbian/ Hungarian
Odd participants	Valence dimension	.98/.99		
	Arousal dimension		.94/.95	
	Dominance dimension			.94/.96

Note. All correlations are significant at p < .001.

The Cronbach's alpha coefficient in the Hungarian group for the valence dimension was .62, for arousal .87, and for dominance .88. In the Serbian group, the Cronbach's alpha coefficient for valence was .68, for arousal was .93, for dominance was .95. The mean ratings and standard deviations for the sixty pictures are

given in the Appendix, separately for the Hungarian and Serbian subgroups from Serbia (Table A and Table B).

Differences between the Hungarian Sample from Serbia, Serbian Sample from Serbia, the American Sample, and the Hungarian Sample from Hungary

In the next step, we wanted to check if there were differences among the ratings of the Hungarian sample from Serbia, the Serbian sample from Serbia, the American sample, and the Hungarian sample from Hungary. We presumed that the American results, i.e. their normative ratings, could be taken as the baseline.

The American, Serbian, and Hungarian group from Serbia, and the Hungarian group from Hungary were compared with MANOVA. For the analysis, we used the mean ratings of the pictures as the dependent variable, and the group status (Hungarian from Serbia, Serbian from Serbia, American, Hungarian from Hungary), and sex (male or female) as the independent variables. There were statistically significant differences between the groups regarding the group status, $F(9,1416) = 14.82$, $p < .001$, *Pillai's Trace* = .26, partial $\eta^2 = .09$, as well as regarding sex, $F(3,470) = 14.85$, $p < .001$, *Pillai's Trace* = .09, partial $\eta^2 = .09$.

There were significant differences on the arousal dimension with the group status as the independent variable, $F(3,472) = 3.68$, $p = .01$, partial $\eta^2 = .02$. Bonferroni post hoc comparisons showed that there was a statistically significant difference between the results of the Hungarian group from Serbia and the Serbian group from Serbia at $p = .03$, and the Hungarian group from Serbia and the American group at $p = .05$. The means and standard deviations are shown in Table 2.

Table 2
Descriptive statistics for arousal in the Hungarian group from Serbia, the Serbian group from Serbia, the American group for male and female participants

Arousal	*N*	*M*	*SD*
Hungarian group from Serbia	120	5.32	1.43
Serbian group from Serbia	120	4.80	1.32
American group	120	4.85	1.26

Note. N – number of participants; *M* – mean; *SD* – standard deviation.

There were significant differences on the dominance dimension with the group status as the independent variable: $F(3,472) = 7.69$, $p < .01$, partial $\eta^2 = .05$. Bonferroni post hoc comparisons showed a statistically significant difference between the Hungarian group from Serbia and the Hungarian group from Hungary, $p < .001$, and the Hungarian group from Hungary and the American group, $p = .002$. The means and standard deviations of the groups are shown in Table 3.

Table 3
Descriptive statistics for dominance in the Hungarian group from Serbia, the American group, the Hungarian group from Hungary for male and female participants

Dominance	N	M	SD
Hungarian group from Serbia	120	5.00	1.52
Hungarian group from Hungary	120	5.79	1.38
American group	120	5.18	1.20

Descriptive statistics for males and females on the arousal and dominance dimensions are shown in Table 4.

Table 4
Descriptive statistics for arousal and dominance in the male and female group (Hungarian from Serbia, Serbian from Serbia, American, Hungarian from Hungary)

		Arousal		Dominance	
	N	*M*	*SD*	*M*	*SD*
Males	120	5.10	1.42	5.20	1.31
Females	120	5.55	1.42	4.81	1.70

Regarding sex, significant differences were found on the arousal dimension $F(1,472) = 6.72$, $p = .01$, partial $\eta^2 = .01$. The dominance dimension also showed significant differences with respect to sex $F(1,472) = 19.27$, $p < .001$, partial $\eta^2 = .04$. The interaction between language and sex was not significant.

The Relationship between the Valence of Positive and Negative Pictures and Arousal Ratings (for the Serbian and the Hungarian Groups from Serbia)

We separated the stimuli to analyze the approach and avoidance motivational systems. Mean valence and arousal ratings of the pictures were used to test the relationship of valence and arousal, separately for negative pictures and separately for positive ones. We dichotomized the pictures by using the mean valence rating, with the cut point set on the value five. All the pictures with mean valence ratings below five were categorized as negative, and above five as positive.

In the Serbian subgroup, the Pearson correlation between valence and arousal for the positive pictures was $r = .61$, significant at the level $p < .001$, for thirty-six pictures. The correlation between the two dimensions for the negative pictures was $r = -.68$, significant at the level $p < .001$, for twenty-four pictures.

The dichotomization procedure in the Hungarian group was the same as in the previous description. For a total of thirty-four positive pictures, the correla-

tion was r = .48, significant at a level p = .004. The Pearson correlation of the valence and arousal ratings of the negative pictures was r = -.59, significant at p = .002 for twenty-six pictures.

In both groups there was a positive linear correlation between valence and arousal for the positive pictures, and a negative linear correlation for the negative ones. This implies that the motivational systems of approach (positive pictures) and avoidance (negative pictures) were mirrored in the answers of the two groups.

Correlations between the Results of the Two Groups from Serbia, the Group from America, the Group from Bosnia and the Results of the Hungarian Group from Hungary

Correlations between ratings of two groups from Serbia and ratings from other groups are presented in Table 5. All of them are high, between r = .80-.97, which means that the ratings are similar in the countries in question.

Table 5
Correlations between ratings of two groups from Serbia and ratings from other groups

		Hungarian ratings from Serbia	Bosnian ratings	American ratings	Hungarian ratings from Hungary	Serbian ratings from Serbia
				Valence		
Ratings from Serbia	Serbian rating	.97	.97	.94	.96	1
	Hungarian rating	1	.97	.95	.96	.97
				Arousal		
	Serbian rating	.92	.83	.87	.80	1
	Hungarian rating	1	.88	.88	.87	.92
				Dominance		
	Serbian rating	.94	.91	.88	.85	1
	Hungarian rating	1	.91	.87	.85	.94

Note. All correlations are significant at $p < .001$.

Curve Fit Estimation – Hungarian and Serbian Subgroups from Serbia

We applied a curve fit estimation analysis to see whether a linear or a quadratic relationship was more applicable to our data. Following Verschuere et al.

(2001) we used for the analysis the groups of positive and negative pictures which were previously dichotomized.

In the Hungarian group, for the negative pictures of valence and arousal dimensions, the curve fit estimation showed that both the linear (R^2 = .35, p= .002) and the quadratic (R^2 = .35, p = .007) relationship was significant. We accepted the quadratic relationship, where the non-standardized *b1* = 1.26, *b2* = -.06. Thus, the slope was steeper, bigger, and positive for the first half, and small and negative for the second half.

The estimation for the Hungarian group for the positive pictures on the valence and arousal dimensions showed both the linear (R^2 = .23, p = .004) and quadratic (R^2 = .29, p = .005) relationship as significant. We accepted the quadratic relationship, where the non-standardized *b1* = 1.71, *b2* = -.013. Thus, the slope was steeper, bigger and positive for the first half, and small and negative for the second half.

The analysis for the Serbian group for the negative pictures on the valence and arousal dimensions showed that both the linear (R^2 = .47, p < .001) and the quadratic (R^2 = .47, p = .001) relationship was significant. We accepted the quadratic relationship, where the non-standardized *b1* = .25, *b2* = .05. The slope was steeper, a little bigger and positive for the first half, and small and also positive for the second half.

In the Serbian group, the analysis showed for the positive pictures that both the linear (R^2 = .38, p < .001) and quadratic (R^2 = .37, p < .001) relationships are significant on the valence and arousal dimensions. We accepted the quadratic relationship, where the non-standardized *b1* = .89, *b2* = -.05. Thus, the slope was somewhat steeper, bigger and positive for the first half, and small and negative for the second half.

In all the cases, this quadratic relationship means that as arousal grows, valence grows, but after the half of the slope it stagnates.

Discussion

Our study was aimed at checking the ratings of the pictures/photographs of the International Affective Picture System (Lang et al., 2005) in Serbia. It was done on two groups with a different native language, but from the same cultural background, a Serbian group and a Hungarian group.

There was a need for checking the validity of the pictures for inducing emotional reactions on the population from Serbia, because numerous studies use emotion-laden stimuli in the field of affective sciences. While normative ratings for the IAPS exist for various languages and cultures, to the best of our knowledge, no such ratings have been established for Serbia so far (e.g., Alčaković et al., 2018; Deák, 2011; Deák et al., 2010; Drače et al., 2013; Dufey et al., 2011; Grühn & Scheibe, 2008; Lohani et al., 2013).

Additionally, the cross-cultural – Hungarian, Serbian from Serbia, Hungarian from Hungary, and American comparison can give us a valuable insight into the modulating effect of cultural contexts and national habits or trends in rating differences. In addition to this, the comparison of the two subgroups from Serbia has a pragmatic explanation and an exploratory aim: we want to have ratings for both of these groups for further studies. Also, we hypothesize that if there are differences between the two groups, they might be either in arousal or dominance or in both. This hypothesis is connected to the more flexible migrations and traveling opportunities between the countries (including Serbia and Hungary), which can result in the fact that minority group members may develop (or have a chance for developing) different cultural (or a mixed, bicultural) identities. This fact and the minority group status may further affect emotional functioning in both positive and negative ways, and result in different response patterns in this group.

Our results have shown that regarding the affective space, we have found a positive linear relationship between the valence and arousal dimensions for the positive pictures in both subgroups, and also a negative linear relationship between the dimensions of valence and arousal for the negative pictures. The more positive or more negative the picture was, the more arousing it was perceived. Thus, the approach-avoidance motivational systems are implied in the results of the ratings. The affective states induced by positive and negative pictures seem to differ in pleasantness and their arousing nature. For the results of Hungarian and Serbian groups, it seems that a quadratic fit is more applicable, and therefore valence grows as arousal grows for all the results in the first half of the curve. As arousal is higher, valence is also growing, but after a certain amount of arousal, the valence dimension does not show a change. Studies so far have found that linear, quadratic or both relationships can be significant for the affective space (Bradley & Lang, 2007; Deák, 2011; Deák et al., 2010).

To compare our results cross-culturally and check for consistency, we also correlated the picture ratings from America, Bosnia, Hungary, our Hungarian group from Serbia, and our Serbian group from Serbia. The highest connections were found between the two groups from Serbia, showing similarly evoked emotional reactions, but the correlations with other neighboring countries were also very high. Thus, we could conclude that the validity of the IAPS database was replicated in our study. The the pictures/photographs could be used in Serbia in a similar way as in the other foreign countries, although cultural specificities emerged (e.g., Deák, 2011; Deák et al., 2010; Drače et al., 2013).

Previous studies have shown that cross-cultural variation mostly occurs on the dimensions of arousal and dominance (e.g., Deák et al., 2010; Drače et al., 2013; Dufey et al., 2011; Lasaitis et al., 2008; Lohani et al., 2013; Verschuere et al., 2001), and this study confirms these findings as we have found cross-cultural variation on these dimensions as well.Three existing studies have proved to be especially valuable for us since the respondents who participated in the studies

are from a similar linguistic and cultural background as the participants in the following study: Deák (2011), Deák et al. (2010), and Drače et al. (2013).

We have found a significant difference in arousal comparing the results of the American sample and our Hungarian group, where the ratings are higher in our Hungarian group. Also, there is a difference between the two groups from Serbia: Hungarians obtainhigher ratings in this dimension. On the dominance dimension, we have replicated the findings of Deák et al. (2010) on a smaller set of pictures, as dominance was higher in the Hungarian group from Hungary than in the American one. Our Hungarian sample differs from the sample from Hungary because our Hungarian group has shown higher arousal ratings in comparison to the Americans, but there is no significant difference in dominance. This means that our Hungarian group might have a lower level of the threshold for arousal than the American one, since the pictures appear to have a more intensive impact on our group. Our Hungarian group has shown lower dominance ratings than the Hungarian group from Hungary. This means that our Hungarian group feels less dominant while viewing the pictures/photographs with the affective content, meaning that they are more prone to be affected by emotionally impacting effects from the surroundings than the Serbian group or the Hungarian group from Hungary. The Hungarian minority group has had less control over the emotional reactions elicited by the pictures. Drače et al. (2013) have found that Bosnian arousal ratings are higher than the American ones, but in this respect, we have not found any differences between the Serbian and the American ratings.

Some researchers argue that one possible explanation for the cross-cultural differences is the existence of a conceptual and semantic difference among languages and cultures (Dufey et al., 2011; Lasaitis et al., 2008), and therefore the meanings of the dimensions differ. Another explanation suggests that there may be a variation in the emotional disposition (Bradley & Lang, 2007; Drače et al., 2013; Dufey et al., 2011), especially in ratings of the arousal dimension, which might be related to emotional expressivity (Drače et al., 2013; Dufey et al., 2011). Concretely, lower arousal ratings mean "calmer emotional reactions" (Bradley & Lang, 2007: 34.). We hypothesize that our Hungarian subgroup is more emotionally expressive and more easily emotionally dislocated than the American and the Serbian group, and also, that this group has less control over their emotions and higher responsiveness to the shown stimuli (see Silva, 2011, on a reverse pattern). Regarding the dominance dimension, Deák et al. (2010) argue that the cultural context and social learning might have an effect on it, and this might hold true in the present research as well.

Sex differences have also emerged in our study. Accordingly, the arousal ratings are higher in females, and the dominance ratings are higher in males. These results are in line with the results of the previous studies: Soares et al. (2015) have found higher levels of valence and dominance in male ratings, and Deák (2011) and Deák et al. (2010) have found higher dominance ratings for males. In addition to this, Deák et al. (2010) have found higher arousal ratings in the female

group. Our results resemble the results from Deák et al. (2010) study, who have found the same differences.

The general conclusion is that the valence dimension is a culturally robust dimension, which is stable between genders, since no variations have been found in this respect among the groups. This means that people tend to perceive the positive, negative, and neutral qualities of nature, objects, living creatures, social situations in a very similar way in Serbia and also world-wide. Based on our results, the valence dimension is cross-culturally stable, which can also indicate its importance in the hierarchy of the "three dimensions/qualities of emotional experience". However, we cannot exclude the other two dimensions, because they can give us additional information about the culture and gender-specific reactions, evaluations and subjective experience in the emotional domain.

Future studies in this field might include different sets of stimuli from the IAPS and various age groups, and should also combine the age groups with sex differences to give new insights into the emotional world of different groups of participants from Serbia. Also, the pictures from the IAPS could be used with specific groups of the research participants, like the patients with mood disorders and various psychopathological diagnoses, and people with behavioral problems and antisocial conduct.

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Appendix

Table A
The means and standard deviations on the pictures in the Hungarian group from Serbia

IAPS		All subjects - Hungarian ratings from Serbia					
		Valence		Arousal		Dominance	
PICTURE NUMBER	Title	*M*	*SD*	*M*	*SD*	*M*	*SD*
1090	Snake	3.63	1.63	6.97	1.93	3.59	2.23
1201	Spider	3.17	2.25	7.06	2.35	3.14	2.42
1390	Bees	5.06	1.90	5.70	2.29	4.54	2.41
1463	Kittens	7.79	1.52	4.63	2.79	6.27	2.08
1601	Giraffes	7.82	1.26	4.59	2.68	6.38	2.09
1660	Gorilla	5.30	2.18	4.91	2.08	4.56	1.99
1710	Puppies	8.54	0.98	5.75	2.88	6.80	1.89
1740	Owl	6.52	1.70	3.70	2.28	5.51	1.82
1812	Elephants	7.62	1.60	4.46	2.69	5.80	2.05
2080	Babies	7.99	1.62	4.86	2.58	5.96	2.03
2110	Angry Face	3.89	1.84	5.25	2.11	4.97	2.41
2190	Man	5.11	0.95	3.56	1.63	5.00	1.64
2391	Boy	7.99	1.24	5.66	2.59	7.36	1.46
2520	Elderly Man	3.97	2.13	4.01	1.95	3.65	1.94
2620	Woman	6.00	1.49	3.31	2.00	5.68	1.74
2751	Drunk Driving	2.28	1.87	6.13	2.10	3.42	2.35
2752	Alcoholic	4.18	2.21	5.34	1.79	4.46	2.17
2890	Twins	5.07	1.33	3.60	1.97	5.11	1.47
3100	Burn Victim	1.30	0.70	6.69	2.12	1.76	1.45
3190	Scar	3.32	1.81	5.62	2.02	3.38	1.93
3280	Dental Exam	3.43	1.90	6.20	2.09	3.07	2.04
3350	Infant	1.79	1.44	6.39	2.12	2.35	1.94
3530	Attack	1.72	1.24	7.39	1.79	2.00	1.72
4532	Attr Man	7.25	1.73	4.44	2.65	6.83	1.87
4598	Couple	6.46	2.86	6.59	2.38	5.48	2.56
4652	Erotic Couple	7.62	1.38	7.45	1.79	6.96	1.78

4669	Erotic Couple	7.99	1.30	7.52	2.02	7.25	1.68
4770	Female Kiss	5.54	2.46	6.11	2.08	5.82	1.98
5260	Waterfall	7.25	1.70	5.73	2.80	5.31	2.44
5460	Astronaut	5.81	1.78	6.01	2.55	4.88	2.59
5532	Mushrooms	5.44	1.30	3.38	1.98	5.15	1.71
5533	Mushrooms	5.63	1.51	4.04	2.24	5.30	1.53
5594	Sky	6.22	2.00	4.47	2.49	4.74	1.97
5750	Nature	7.34	1.46	3.15	2.42	6.23	1.91
5760	Nature	8.19	1.31	3.64	2.87	7.03	2.06
6010	Jail	3.17	1.84	5.08	2.00	3.18	2.07
6540	Attack	2.86	2.64	6.90	2.39	3.51	2.88
6570	Suicide	1.83	1.44	6.74	2.29	3.52	2.73
7030	Iron	4.90	1.20	3.42	2.49	5.96	2.01
7060	Trash Can	4.69	1.15	3.16	1.99	5.59	1.62
7150	Umbrella	5.18	1.41	2.63	1.79	5.92	1.85
7190	Clock	5.18	1.77	3.99	2.23	4.94	2.27
7200	Brownie	7.49	1.46	4.90	2.65	6.75	1.73
7235	Chair	5.43	1.54	2.17	1.71	5.97	1.95
7260	Torte	7.93	1.87	5.54	2.76	6.90	2.17
7360	Flies On Pie	5.99	3.09	5.93	2.40	5.79	2.53
7560	Freeway	4.61	1.93	4.94	2.55	4.71	2.32
7640	Skyscraper	4.60	1.59	6.93	2.47	4.74	2.68
8021	Skier	7.25	1.57	7.03	2.17	6.65	2.05
8300	Pilot	7.30	2.05	7.46	1.90	5.67	2.43
8400	Rafters	6.83	1.76	7.62	1.70	6.04	2.26
8461	Happy Teens	8.14	1.43	6.17	2.32	6.76	1.70
8540	Athletes	7.80	1.56	5.76	2.72	7.10	1.82
9140	Cow	1.73	1.26	5.59	2.16	2.54	1.85
9330	Garbage	1.99	1.49	5.36	2.31	3.31	2.03
9411	Boy	3.60	1.90	6.77	1.87	4.30	2.56
9432	Mastectomy	2.77	1.80	5.43	1.96	3.21	2.06
9571	Cat	1.87	1.51	6.03	2.13	2.86	2.06
9600	Ship	2.01	1.37	7.04	1.99	2.20	2.00
9620	Shipwreck	2.11	1.66	6.84	1.97	2.77	2.29

Table B
The means and standard deviations on the pictures in the Serbian group from Serbia

IAPS		All subjects - Serbian ratings from Serbia					
		Valence		Arousal		Dominance	
PICTURE NUMBER	Title	*M*	*SD*	*M*	*SD*	*M*	*SD*
1090	Snake	5.41	1.98	5.04	2.34	5.23	2.32
1201	Spider	4.26	2.05	5.54	2.60	4.78	2.74
1390	Bees	5.68	2.12	4.80	2.36	5.38	2.36
1463	Kittens	7.84	1.49	5.82	2.50	6.86	1.75
1601	Giraffes	7.72	1.33	5.10	2.01	7.26	1.54
1660	Gorilla	5.38	1.54	4.58	2.18	5.58	2.12
1710	Puppies	8.56	0.95	6.76	2.19	7.44	1.54
1740	Owl	6.69	1.42	4.27	1.90	6.55	1.72
1812	Elephants	7.50	1.15	4.68	2.13	6.32	1.91
2080	Babies	7.32	1.83	5.00	2.56	6.24	2.13
2110	Angry Face	4.73	1.27	3.22	1.83	6.02	1.85
2190	Man	5.30	1.13	2.66	1.70	6.10	1.72
2391	Boy	6.92	1.74	4.65	2.34	7.41	1.61
2520	Elderly Man	4.63	1.94	3.69	1.92	5.18	2.03
2620	Woman	6.24	1.36	3.56	1.93	6.48	1.80
2751	Drunk Driving	2.96	1.77	5.78	2.26	4.24	2.57
2752	Alcoholic	4.52	2.26	4.30	2.02	5.26	2.38
2890	Twins	5.02	1.22	2.60	1.93	5.84	2.01
3100	Burn Victim	2.22	1.71	5.73	2.40	3.51	2.33
3190	Scar	4.24	1.48	4.27	1.82	4.71	2.36
3280	Dental Exam	3.66	1.85	5.14	2.52	4.52	2.83
3350	Infant	2.38	1.78	5.85	2.27	3.50	2.16
3530	Attack	3.08	1.81	6.16	2.09	3.86	2.53
4532	Attr Man	6.10	1.34	3.72	2.21	6.94	1.61
4598	Couple	5.14	2.78	5.46	2.31	5.56	2.26
4652	Erotic Couple	7.38	1.64	7.26	1.60	7.18	1.96
4669	Erotic Couple	7.60	1.48	6.81	2.09	7.46	1.77
4770	Female Kiss	6.24	2.03	6.00	2.21	6.56	1.79

5260	Waterfall	6.63	1.58	5.18	2.41	6.16	2.04
5460	Astronaut	6.16	1.96	5.78	2.50	5.76	2.45
5532	Mushrooms	5.66	1.44	3.22	1.94	6.00	2.14
5533	Mushrooms	5.32	1.27	3.28	1.69	5.62	1.74
5594	Sky	6.86	1.54	3.55	2.52	6.37	2.07
5750	Nature	7.06	1.57	3.46	2.57	7.10	1.67
5760	Nature	7.82	1.47	4.63	2.71	7.49	1.58
6010	Jail	3.74	1.83	4.42	1.91	4.12	2.42
6540	Attack	2.63	1.78	5.81	2.15	4.21	2.42
6570	Suicide	2.94	2.20	5.31	2.51	4.55	2.78
7030	Iron	5.33	1.46	2.34	2.08	6.61	1.98
7060	Trash Can	5.27	1.18	2.22	2.07	6.44	1.95
7150	Umbrella	5.17	1.46	2.33	1.85	5.90	1.80
7190	Clock	5.33	1.56	3.08	2.25	6.24	2.06
7200	Brownie	6.50	1.23	4.32	2.27	6.96	1.64
7235	Chair	5.51	1.17	1.73	1.28	6.85	1.94
7260	Torte	7.58	1.53	4.83	2.57	7.19	1.77
7360	Flies On Pie	5.10	2.43	4.30	2.27	5.72	2.41
7560	Freeway	4.84	1.61	3.98	2.25	5.39	2.08
7640	Skyscraper	4.59	1.58	5.98	2.75	5.04	2.47
8021	Skier	7.54	1.46	6.27	2.48	6.73	1.87
8300	Pilot	7.60	1.53	6.48	2.54	6.38	2.27
8400	Rafters	6.61	2.01	6.19	2.61	5.77	2.23
8461	Happy Teens	7.29	1.40	5.38	2.48	6.85	1.70
8540	Athletes	6.30	1.61	4.42	2.35	6.88	1.84
9140	Cow	2.40	1.85	5.31	2.35	4.31	2.49
9330	Garbage	2.80	1.74	4.25	2.49	4.94	2.51
9411	Boy	4.22	1.64	5.50	2.04	4.82	2.14
9432	Mastectomy	3.24	1.84	4.46	2.10	4.51	2.17
9571	Cat	2.26	1.93	5.66	2.32	3.88	2.45
9600	Ship	3.00	1.86	5.70	2.33	4.02	2.51
9620	Shipwreck	3.18	1.76	5.42	2.20	3.60	2.44

Beata Grabovac

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VALIDACIJA MEĐUNARODNE BAZE AFEKTIVNIH FOTOGRAFIJA (IAPS) U SRBIJI: POREĐENJE SRPSKOG I MAĐARSKOG UZORKA

Cilj rada je bio da proširi istraživanja koja se vrše u svetu na Međunarodnoj Bazi Afektivnih Fotografija (IAPS) i na Srbiju. U istraživanju je ukupno učestvovalo 158 studenata, devedesetoro mađarskih i šezdeset osmoro ispitanika srpske nacionalnosti. Ispitanici su ocenjivali šezdeset slika iz IAPS baze na dimenzijama valence, pobuđenosti i dominantnosti. Jedan od glavnih ciljeva bio je poređenje rezultata dobijenih u Srbiji sa rezultatima iz Severne Amerike. Našli smo značajne međugrupne razlike na dimenziji pobuđenosti između grupe iz Severne Amerike i mađarske grupe. Pored toga, dobili smo značajne razlike između mađarske i srpske grupe iz Srbije, kao manjinske i većinske grupe. Rezultati su pokazali da se ove dve grupe značajno razlikuju na dimenziji pobuđenosti. Uzimajući u obzir rezultate iz Mađarske, statistički je značajna razlika između mađarske grupe iz Mađarske i američke grupe, kao i mađarske grupe iz Mađarske i naše mađarske grupe na dimenziji dominantnosti. Polne razlike su dobijene na dimenziji pobuđenosti i dominantnosti. One su u skladu sa rezultatima prethodnih kros-kulturalnih istraživanja. Rezultati korelacije ocena iz Amerike, Bosne, Mađarske i dveju grupa iz Srbije pokazuju da je najjača povezanost dobijena među odgovorima kod podgrupe iz Srbije. Na osnovu svih dobijenih rezultata možemo zaključiti da su afektivne ocene u Srbiji slične onima iz drugih zemalja i da se IAPS baza može koristi u istraživačke svrhe u Srbiji.

Ključne reči: emocionalni stimulusi, IAPS, validacija

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DO MORPHOLOGICAL FEATURES AFFECT THE COGNITIVE PROCESSING OF DEVERBAL NOMINALS IN SERBIAN?[2]

The aim of this study was to examine whether different morphological characteristics of Serbian deverbal nominals affect their lexical processing. According to morphological differences, there are three subtypes of the process and result deverbal nominals in Serbian: (i) result nominals end with the zero suffix, while process nominals end with the deverbal suffix –nje (e.g., žubor/žuborenje [eng. burble]); (ii) result nominals differ from process nominals in the presence of the –va infix (e.g., rešenje/rešavanje [eng. solution]); (iii) process nominals end with the deverbal suffix –nje, while result nominals end with other derivational suffixes (e.g., rotiranje/rotacija [eng. rotation]). The final results of three self–paced reading experiments suggest that different morphological features do not affect the processing of deverbal nominals, which strongly supports a–morphous approach to the morpho–lexical processing, as well as the distributed morphology perspective in the field of theoretical linguistics.

Key words: a–morphous morphology, derived nouns, deverbal nominalization, distributed morphology, morpho–lexical processing

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Introduction

Deverbal nominalization is a process in which derived nouns are formed out of verbs. In the last few decades, this phenomenon has been the subject of a number of debates in theoretical linguistics, mostly due to its very complex semantic and syntactic nature (Alexiadou, 2010; Grimshaw, 1990; Paul, 2014; Zlatić, 1997). Grimshaw (1990) has proposed a division of deverbal nominals into three categories: i) process or complex event nominals, which have an argument structure and take obligatory complements (e.g., deverbal nominal *examination* in the example *The instructor's examination of the student*); ii) result nominals, which do not take obligatory complements, therefore they do not have an argument structure (e.g., deverbal nominal *exam* in the example *The instructor's exam*); iii) simple event nominals, which also do not take obligatory complements and do not have an argument structure (e.g., deverbal nominal *examination* in the example *The instructor's examination*). Although the difference between these types of deverbal nouns is clear, this division is proven to be appropriate only in the English language. Previous studies conducted in Serbian suggest that the third category, simple event nominals, is not a relevant category in this language (Gatarić, Srdanović, Nenadić, & Šarić, 2019; Radman, 2015; Srdanović, Gatarić, & Šarić, 2018; Zlatić, 1997). The research conducted by Srdanović et al. (2018) propose both theoretical and experimental vidimus that simple event nominal category is considered to behave identically as process deverbal nominals in Serbian, therefore not satisfying any condition to be seen as a separate category or subcategory in Serbian. Furthermore, it seems that only two distinctive categories of deverbal nominals are relevant for the Serbian language: i) result deverbal nominals (e.g., deverbal nominal *drhtaj* in the example *Snežanin drhtaj je nagoveštavao dolazak zime* [eng. *Snežana's tremble signalled the arrival of winter*]), and ii) process or complex event nominals (e.g., deverbal nominal *drhtanje* in the example *Snežanino drhtanje ruku je nagoveštavalo dolazak zime* [eng. *Snežana's trembling of hands signalled the arrival of winter*]) (Gatarić et al., 2019; Radman, 2015; Srdanović et al., 2018). The key difference between these two types of deverbal nominals is that the process deverbal nominals take obligatory arguments, whereas the result deverbal nominals do not (Grimshaw, 1990). Moreover, the process deverbal nominals are created from imperfective verbs, while the result deverbal nominals are created from perfective verbs (Gatarić et al., 2019; Radman, 2015; Srdanović et al., 2018; Zlatić, 1997). These semantic and syntactic differences are ubiquitous in many languages, while the morphological differences between process and result deverbal nominals vary from language to language, depending on the richness of morphology of the language in question.

Morphological Distinction between Deverbal Nominals in Serbian

All Slavic languages are well–known for their rich morphology, which makes them perfect candidates for research of morphological effects in morpho–lexical

processing. Previous studies interested in the theoretical explanation of deverbal nominalization in Serbian suggest that this phenomenon is morphologically very complex (Ignjatović, 2012; Matracki & Kovačić, 2016). In Serbian, process and result deverbal nominals differ in various morphological characteristics, which means that there are a lot of derivational suffixes related to deverbal nominals (e.g., *–nje*, *–ba, –ija, –aj, –nja, –ak* etc.), as well as the presence/absence of the infixes (e.g., *–va*) in deverbal nominals. Following these morphological differences, three subtypes of process and result deverbal nominals can be distinguished in Serbian: (i) result deverbal nominals have the zero suffix, and the process deverbal nominals have the deverbal suffix *–nje* (e.g., *let/letenje* [eng. *flying*]); (ii) result and process deverbal nominals differ in the presence of the *–va* infix (e.g., *rešenje/rešavanje* [eng. *solving*]); (iii) process nominals end with the deverbal suffix *–nje*, while the result nominals end with other deverbal suffixes (e.g., *rotiranje/rotacija* [eng. *rotation*]). As previously mentioned, to the best of our knowledge, there are no previous empirical studies interested in the examination of deverbal nominals processing with respect to these morphological differences.

Cognitive Processing of Deverbal Nominals

Having in mind the fact that this phenomenon has been intriguing to researchers in the field of theoretical linguistics for years, it is quite astonishing that a minimal interest has been devoted to deverbal nominalization in the domain of psycholinguistics. The first study interested in the examination of the influence of syntactic complexity of deverbal nominals on the processing of entire sentences with the deverbal nominals was conducted in English (Kennison, 1999). The results of this study suggested that sentences with the deverbal nominals with simpler linguistics structure were processed faster than those with the complex syntactic structure. Similar study was conducted in modern Greek with the final results suggesting that the more complex the syntactic structure of deverbal nominals was, the longer time was needed for their processing (Manouilidou, 2006). Taken together, previously described studies supported the idea that semantic and syntactic complexities played the dominant roles in the cognitive processing of deverbal nominals. Furthermore, previous empirical studies interested in the syntactic and semantic differences of process and result deverbal nominals were also conducted in Serbian (Gatarić et al., 2019; Radman, 2015). These studies were designed as a visual lexical decision task (Radman, 2015), as well as the self–paced reading task (Gatarić et al., 2019) with the process and result deverbal nominals as stimuli. The final results of both researches suggested that semantically and syntactically more complex deverbal nominals (process deverbal nominals) were processed slower than those with the simpler linguistic structure (result deverbal nominals). Moreover, a methodologically different study with naturalness judgments and continuation judgments tasks was performed in English (Smirnova, 2015). This study was interested in the comprehension process of

English deverbal nominals, and the final results suggested that deverbal nominals with the more complex linguistic structure were rated as less acceptable according to participants (Smirnova, 2015). Put it differently, it is possible to implicitly conclude that participants perhaps would need more time to process deverbal nominals that are less acceptable to them, namely those that are syntactically more complex in English. Those results go in line with the previous findings in English (Kennison, 1999), modern Greek (Manouilidou, 2006), and Serbian (Gatarić et al., 2019; Radman, 2015). However, it is important to note that neither of the mentioned studies is interested in the examination of the influence of strictly morphological differences of deverbal nominals on their lexical processing, and all of them control (and vary) only for the syntactic and semantic features of deverbal nominals. Also, neither of these studies control for the eventual morphological effects that could affect the lexical processing of deverbal nominals, which leavet an open question about the influence of morphological differences in the domain of cognitive processing of process and result deverbal nominals.

Different Perspectives in the Processing of Morphologically Complex Words

The morphological complexity of words has intrigued and inspired researchers in the field of psycholinguistics to propose a model that could explain the cognitive processing of morphologically complex words in any language. On the one hand, there is a group of authors who propose the traditional models of morphological processing, like for example Decomposition model (Taft, 2004; Taft & Forster, 1975). These lexicon–based models accentuate the importance of the characteristics of single morphemes in the lexical processing, and according to the authors of these models, morphemes are represented as independent lexical units in the mental lexicon. Put differently, these models emphasize that morphological characteristics (e.g., suffix frequency, suffix ambiguity etc.) affect the cognitive processing of the whole words, phrases or sentences (Taft, 2004; Taft & Forster, 1975). Although this perspective counts a large number of supporters, it cannot explain many phenomena observed in the languages with rich morphology (e.g., Serbian) (Kostić, 2010). On the other hand, there is a group of authors who propose an a–morphous perspective in the morpho–lexical processing. They suggest that morphemes do not play an important independent role in the lexical processing (Anderson, 1992; Bybee, 1985), and they are not present as a single level of processing per se, but as a product of mapping a form to meaning. Following this theoretical perspective, psycholinguists have proposed a few models for the interpretation of results observed in the empirical language studies. One of the most popular models, the one with the greatest success in interpreting a large number of morpho–lexical effects, is Naïve Discriminative Learning (NDL) model (e.g., Baayen, 2011; Milin, Feldman, Ramscar, Hendrix, & Baayen, 2017). This model is a learning–based model, and it

successfully explains various morpho–lexical phenomena in different languages (e.g., Gatarić, 2019; Milin, Divjak, Dimitrijević, & Baayen, 2016; Milin, Feldman, Ramscar, Hendrix, & Baayen, 2017; Plag & Winter Balling, in press). Also, it is important to mention that historically, in the domain of psycholinguistics, Manelis and Tarp (1977) proposed a very similar model of processing morphologically complex words many years before previously mentioned a–morphous morphology models. This model was the first one which declined the existence of decomposition in the morpho–lexical processing (Manelis & Tarp, 1977), suggesting that single morphemes characteristics do not influence the whole–word processing. However, this model has not experienced great popularity among researchers interesting in this topic. Last but not least, it is important to mention that a–morphous perspective in the lexical processing is very similar to distributed morphology, the theoretical perspective from derivational morphology (Halle, 1990, 1997). Both perspectives reject the existence of the lexicon, the existence of the single morpheme characteristics effects in the lexical processing, and highlight the importance of semantic and syntactic features.

The Present Study

Guided by the fact that there are no previous similar studies dealing with this topic, the main aim of this study was to examine whether the specific morphological features of Serbian deverbal nominals affected their processing. The morphological differences of deverbal nominals in Serbian were classified in three groups: (i) result deverbal nominals have the zero suffix, and the process deverbal nominals have the deverbal suffix *–nje*; (ii) result and process deverbal nominals differ in the presence of the *–va* infix; (iii) process nominals end with the deverbal suffix *–nje*, while the result nominals end with other deverbal suffixes. According to these differences, three self–paced reading tasks were created, consisting of the three aforementioned subgroups of Serbian deverbal nominals. Furthermore, the second aim of this study was to answer which of the two perspectives in the morpho–lexical processing, lexicon–based perspective or a–morphous morphology perspective, would be supported by the results of this research.

Experiment 1

The current experiment was aimed at answering whether the specific morphological features of Serbian deverbal nominals affected their processing. In the Experiment 1 process and result nominals differed because the result nominals ended with the zero–morpheme, and the process nominals ended with the deverbal suffix *–nje*, the most frequent deverbal suffix in Serbian (Matracki & Kovačić, 2016). Put it differently, the process nominals had an extra morpheme (deverbal suffix) in this particular subgroup of deverbal nominals, which means that they

were more complex in nature than the result deverbal nominals. The stimuli were presented in the sentence context in the self–paced reading task in all three experiments conducted in this study, following the suggestions from the previous studies about the importance of sentences context in the examination of morpho–lexical processing (e.g., Bertram, 2011; Gatarić, 2019; Rayner, 1989).

Method

Participants. Participants in this experiment were undergraduate students from the Faculty of Philosophy, University of Novi Sad (*N* = 70; mostly female), who participated in this experiment voluntarily. Every participant signed the consent form (approved by the Ethical Committee of the Faculty of Philosophy, University of Novi Sad)[3], and all of them were native speakers of Serbian, with normal or corrected–to–normal vision.

Stimuli. The stimuli in this experiment were 48 sentences with the Serbian process and result deverbal nominals. The first step was a selection of the 24 pairs of deverbal nominals (one was process, and the other one result deverbal nominal) with the same stem, but different endings. Each noun used as a stimulus in the experiment had its pair: 24 result nominals ended with the zero morpheme (e.g., *žubor* [eng. *burble*]), and 24 process nominals ended with the deverbal suffix *–nje* (e.g., *žuborenje* [eng. *burble*]).[4] The pairs of deverbal nominals were used in order to control the effects that could arise from the characteristics of a stem (e.g., morphological family size etc.). Then, the next step was to design identical sentences where both deverbal nouns from the pair (e.g., *žubor*/*žuborenje* [eng. *burble*]) fit great. Having all this in mind, there were created sentences of the same length, and with the following syntactic structure: the subject was always in the first place in the sentence (e.g. *Jovana*), followed by an auxiliary verb (e.g., *je* [eng. *is*]) and a verb (e.g., *čula* [eng. *heard*]). Furthermore, a deverbal nominal appeared always in the fourth position (e.g., *žubor* [eng. *burble*]), and the end of the sentence was reserved for the complement/argument (e.g., *vode* [e.g. *water*]) as illustrated in (1).

1_a) Jovana je čula *žubor* vode.
1_b) Jovana je čula *žuborenje* vode.
[eng. *Jovana heard the burble of water*.]

The same number of filler sentences was created, and all the stimuli were randomly divided into two experimental groups with the Latin square design. Also identical sentences (for one pair of deverbal nominals) were selected as stimuli in

[3] The current research was done while the first and the second author were affiliated with the Faculty of Philosophy, University of Novi Sad, which was the reason why this research was approved by the Ethical Committee of that institution.

[4] A small number of stimuli was selected because it was not possible to find more appropriate deverbal nouns in Serbian, and this was also the case in the following two experiments.

all the experiments, in order to control syntactic effects that could arise from the sentence differences, which was a main difference in comparison to all previously conducted research in Serbian.

Design. The factor that was manipulated in this experiment was the type of deverbal nominals (process or result) that differed in some morphological features (zero morpheme, versus *–nje* suffix). In addition, the word length and lemma frequency were included as the control variables. The lemma frequencies were retrieved from *srWac* corpus (Ljubešić & Klubička, 2016), while the word length was calculated according to the number of letters. The dependent variable in this experiment was the reading time of deverbal nominals (measured in milliseconds).

Procedure. The stimuli were presented in a self–paced reading task created in the software *OpenSesame* (Mathôt, Schreij, & Theeuwes, 2012), on a standard PC configuration (Pentium(R) Dual–Core CPU E6600 processor/3.06 GHz/2.00 GB RAM, with monitor set to 75Hz vertical refresh rate and 1600x1200 pixels resolution). All words from the sentences (including both stimuli and filler sentences) were presented single, one–by–one, at the centre of the screen. The participants were verbally instructed to read the words presented at the screen as quickly as possible, and to press button *ENTER* (on the keyboard) when they read the presented word. The presentation of every trial was preceded by a 500 ms fixation point, which remained on the screen until the participants' response, or until 1500 ms had passed. The interstimulus interval was 500 ms. Control questions (about the previous sentence) were given on the screen on several occasions, in order to check whether participants read sentences carefully and with understanding. The stimuli were written in white (font mono), capitalized, and presented on the black screen. The stimuli materials were preceded by five practice trial sentences, and excluded from the statistical analysis. The order of stimuli presentation was randomized for each participant.

Results

The first step in the preparation of data for the statistical analysis was the exclusion of errors, which represented 2% of the total data. The data were analyzed in free statistical software *R* (R Core Team, 2017), by using the packages *mgcv* (Wood, 2006; 2011) and *itsadug* (van Rij, Wieling, Baayen, & van Rijn, 2016). Following Baayen and Milin (2010), reading times were transformed by applying a log–transformation, as well as the covariates lemma frequency and word length. Moreover, numeric predictors order of trial presentation, lemma frequency, and word length were standardized by centring to zero and dividing by the standard deviation (Gelman & Hill, 2007). Also, the collinearity between numeric predictors was checked, and the Cohen's kappa coefficient (Belsley, Kuh, & Welsch, 1980) shown that it was low (κ = 11.79). The data were analyzed with the Generalized Additive Mixed Model (Wood, 2006, 2011), statistical analysis which was

the least sensitive to collinearity among the predictors, which undoubtedly existed in psycholinguistic studies (Baayen, 2008). In addition, in order to test the significance of the fixed effects, two random effects were controlled: the random effect of stimuli and the random effect of participants. The random effect of participants was included with by–participant factorial smooths over trials from the experiment (Table 1), which increased the level of control of the effects that could result from the trials characteristics in the case of different participants from the experiment. In the final version of GAMMs model, standardized residuals that exceeded the range of –2.5/+2.5 standard units were excluded. Furthermore, the model criticism was applied to the model following the procedure proposed by Baayen and Milin (2010). The best final refitted GAMMs model is presented in the Table 1.

Table 1
Coefficients from the Generalized Additive Mixed Model fitted to transformed response latencies from Experiment 1

Parametric coefficients	Estimate	Std. Error	*t*	*Pr(>|t|)*
Intercept	6.23	.04	125.41	.00***
Type of deverbal nominals = result	–.04	.02	–1.62	.10
Trial order	–.00	.00	–.63	.52
Word length	.01	.01	1.31	.18
Lemma frequency	–.01	.00	–2.25	.02

Smooth terms	edf	Ref.df	*F*	*p*
s(Stimuli)	4.18	44	.10	.29
s(Trial order, Subject)	67.978	629	7.33	.00***

Notes. s – thin plate regression spline smooth.
*** $p < .0001$.

As expected, the final model suggests an inhibitory effect of word length, which means that longer deverbal nominals are processed slower than shorter ones. Also, the same model suggests the existence of the facilitatory effect of lemma frequency. Moreover, the same model suggests that the trial order effect is not statistically significant. In the end, the final model suggests that the main effect of the type of deverbal nominals is not statistically significant, which means that the certain morphological differences between Serbian process and result nominals do not influence their lexical processing.

Experiment 2

This experiment also aimed at answering the same question as the Experiment 1, with a distinction that the stimuli differed in the type of morphological characteristics of Serbian deverbal nominals. Unlike the previous experiment, where the differences were related to suffixesprocess and result nominals in the Experiment 2 differed in the presence of the affix *–va*, namely process nominals had the infixes, but result nominals did not.

Method

Participants. Sixty–five undergraduate students (mostly female) from the same university participated voluntarily in this experiment. As in the Experiment 1, every participant signed the consent form, and all of them were Serbian native speakers with normal or corrected–to–normal vision. None of the participants from the Experiment 2 participated in the Experiment 1.

Stimuli. In this experiment, the stimuli consisted of 44 sentences with the deverbal nominals, where the process and result deverbal differed in the presence of infixes. Firstly, 22 pairs of deverbal nominals differing in the presence of the infix *–va* (but have the same stem and the suffix *–nje*) were collected: result deverbal nominals (N = 22) did not have the infix *–va* (e.g., *isključenje* [eng. *cut*]), while the process deverbal nominals (N = 22) had the infix *–va* (e.g., *isključivanje* [eng. *cut*]). The stimuli sentences were created with the identical syntactic regulations as in the Experiment 1.

1_a) Elektrovojvodina je najavila *isključenje* struje.
1_b) Elektrovojvodina je najavila *isključivanje* struje.
[eng. *The Electric Distribution Company announced power cuts*.]

Like in the Experiment 1, the same number of filler sentences were included in the experiment, and all stimuli were randomly divided into two experimental groups with the Latin square design.

Design and Procedure. The two–level factor was a type of deverbal nominals (process or result), where these two types of deverbal nominals differed in the presence/absence of the infix *–va*. The same control variables and dependent variable as in the Experiment 1 were included in the design of this experiment. The procedure was identical as in the Experiment 1.

Results

The first step in the preparation of data for the statistical analysis was the exclusion of errors, which represented 3% of the total data. The data were analyzed with the same software and packages as in the Experiment 1. Accordingly,

the whole process of the preparation of the data for the statistical analysis was the same as in the Experiment 1. After preparation of the data for the statistical analysis, processing latencies were fitted with the Generalized Additive Mixed Model (Wood, 2006, 2011), with the same random and fixed effects as in the previous experiment. The final GAMMs model, standardized residuals that exceeded the range of –2.5/+2.5 standard units were excluded, and model criticism was applied to that model (Milin & Baayen, 2010). The final GAMMs model is presented in the Table 2.

Table 2
Coefficients from the Generalized Additive Mixed Model fitted to transformed response latencies from the Experiment 2

Parametric coefficients	Estimate	Std. Error	*t*	*Pr(>|t|)*
Intercept	6.29	.05	124.10	.00***
Trial order (order of presentation)	–.00	.00	–.61	.53
Type of deverbal nominals = result	–.04	.02	–1.90	.07
Word length	.01	.00	1.37	.16

Smooth terms	edf	Ref.df	*F*	*p*
s(Lemma frequency): Type of DN (process)	1.000e+00	1.00	2.29	.13
s(Lemma frequency): Type of DN (result)	2.181e+00	2.55	2.43	.12
s(Stimuli)	5.643e–04	39	.00	.61
s(Trial order, Subject)	7.337e+01	629	6.94	.00***

Notes. Type of DN – type of deverbal nominals; *s* – thin plate regression spline smooth.
*** $p < .0001$.

The final model suggests that the effects of covariates (trial order, lemma frequency and word length) are not statistically significant. One of the possible explanations for the lack of this effect can be that the stimuli in this experiment are linguistically more similar to each other, in comparison to those from the previously described experiment, which neutralize the existence of processing differences between the two types of deverbal nouns. Furthermore, the main effect of the type of deverbal nominals is not statistically significant, which suggests that certain morphological features do not influence the processing time of process and result deverbal nominals that differ in the presence of infix.

Experiment 3

Like two previously described experiments, this one had the same research question. Differently, process and result nominals in the Experiment 3 differed in a deverbal suffix in which they ended: process nominals ended with the most frequent deverbal suffix *–nje*, while the result nominals ended with other deverbal suffixes (*–ba, –ija, –aj, –nja, –ak, –idba*).

Method

Participants. Sixty–eight undergraduate students (mostly female) from the Faculty of Philosophy, University of Novi Sad participated voluntarily in this experiment. As in the previous experiments, every participant signed the consent form, and all of them were Serbian native speakers with normal or corrected–to–normal vision. None of the participants participated in the previous two experiments.

Stimuli. The sentences (N = 48) with the pairs of process and result deverbal nominals, which differed in the derivational suffixes which they had, were stimuli. The nouns from the same pair had the identical stems, but they ended with the different deverbal suffix: 24 result nominals ended with some of many deverbal suffixes (e.g., suffix *–aj* in deverbal noun *premeštaj* [eng. *relocation*]), and 24 process nominals ended with the deverbal suffix *–nje* (e.g., *premeštanje* [eng. *relocation*]). In the same manner as in the previous experiments, all the other parts of the stimuli design were the same, and sentences presented as the stimuli were created with the identical syntactic regulations

1_a) Fakultet je najavio *premeštaj* kancelarije.
1_b) Fakultet je najavio *premeštanje* kancelarije.
[eng. *The faculty announced the relocation of the office.*]

Design and Procedure. All variables were the same as in the Experiment 1 and Experiment 2. The procedure of this experiment performance was identical to the Experiment 1 and Experiment 2.

Results

The first step in the preparation of the data for the statistical analysis was the exclusion of errors, which represented 2% of the total data. The data were analyzed with the same software and packages as in the Experiment 1 and Experiment 2. Furthermore, the whole process of preparation of the data for the statistical analysis was the same as in the previous experiments. The same statistical analysis was applied, as well as the process of model criticism. The final GAMMs model is presented in the Table 3.

Table 3
Coefficients from the Generalized Additive Mixed Model fitted to transformed response latencies from the Experiment 3

Parametric coefficients	Estimate	Std. Error	*t*	*Pr(>|t|)*
Intercept	6.26	.05	124.39	.00***
Trial order (order of presentation)	.00	.00	.17	.85
Type of deverbal nominals = result	.00	.01	.18	.85

Smooth terms	edf	Ref.df	*F*	*p*
s(Word length)	2.50	2.88	6.27	.00**
s(Lemma frequency)	1.14	1.22	.68	.49
s(Stimuli)	14.65	44	.51	.01*
s(Trial order, Subject)	70.55	629	7.07	.00***

Notes. s – thin plate regression spline smooth.
* $p < .01$. ** $p < .001$. *** $p < .0001$.

As expected, the final model suggests an inhibitory effect of the word length, which means that longer deverbal nominals are being processed slower. The effect of covariates lemma frequency and trial order are not statistically significant, as well as the main effect of the type of deverbal nominals. This suggests that certain morphological features that vary in this experiment do not contribute to the appearance of a difference in the processing of process and result deverbal nominals.

Discussion

The current research was primarily aimed at examining whether different morphological characteristics of deverbal nominals affected their lexical processing in Serbian. Three experiments with the self–paced reading tasks were carried out in order to get an answer to this research question. Morphological differences of Serbian deverbal nominals were classified into three subgroups, according to which the stimuli for the three experiments were created. The stimuli in the Experiment 1 were sentences with the following type of deverbal nominals: result deverbal nominals had the zero suffix, and the process deverbal nominals had the deverbal suffix *–nje* (e.g., *žubor/žuborenje* [eng. *burble*]). In the Experiment 2, the stimuli were result and process deverbal nominals that differed in the presence of the *–va* infix (e.g., *rešenje/rešavanje* [eng. *solution*]). Moreover, the stimuli in the Experiment 3 were process deverbal nominals that ended with the deverbal

suffix –*nje*, and the result deverbal nominals that ended with other deverbal suffixes (e.g., *rotiranje*/*rotacija* [eng. *rotation*]). Another aim of this research was to answer which of the two perspectives in the morpho–lexical processing would be the most appropriate for the explanation of this phenomenon. The data analysis of all three experiments suggests that there is no effect of morphological characteristics in the cognitive processing of deverbal nominals in the Serbian language. These results support the a–morphous perspective in the lexical processing, as well as the distributed morphology perspective from the theoretical linguistics.

Semantic and syntactic complexity of deverbal nominals drew attention of a number of language scientists who dealt with both theoretical and empirical research approaches to the lexical processing. Grimshaw (1990) proposed a division of deverbal nominals in English into result deverbal nominals, process deverbal nominals, and simple event nominals, while in Serbian only two relevant categories existed: result and process deverbal nominals (Gatarić et al., 2019; Radman, 2015; Srdanović et al., 2018; Zlatić, 1997). Most of the previous theoretical and empirical studies were interested only in the syntactic and semantic effects on cognitive processing of deverbal nominals. Almost all of these studies suggested identical results that the syntactic and semantic complexity of deverbal nominals affected their cognitive processing, and the more complex deverbal nominals were, the longer time they needed to be processed (Gatarić et al., 2019; Kennison, 1999; Manouilidou, 2006; Radman, 2015; Smirnova, 2015). However, none of the mentioned studies dealt with the question of the influence of morphological characteristics of deverbal nominals on their processing. Although theoretical studies in Serbian show that there was a certain morphological complexity of deverbal nominals in this language (Ignjatović, 2012; Matracki & Kovačić, 2016), morphology itself was not the subject of empirical research interested in the processing of deverbal nominals neither in Serbian nor in any other language. Additionally, a discussion that has been going on for years in the morphological research circle is whether morphemes themselves affect processing time of the whole word (equivalent to the traditional approach to morphology) (Taft, 2004; Taft & Forster, 1975), or morphology itself has no impact at all on the lexical processing (equivalent to the a–morphous morphology and distributed morphology) (e.g., Anderson, 1992; Baayen, 2011; Bybee, 1985; Halle, 1990, 1997; Milin et al., 2017). Following that discussion, this study is secondly aimed at answering the question whether the final results of this study goes in line with the traditional perspective to morphology, or it supports the a–morphous morphology perspective.

The results observed in the Experiment 1 suggest that there are no differences in the processing of two types of deverbal nominals that differ because the result nominals end with the zero–morpheme, and the process nominals end with the deverbal suffix –*nje*. This finding is in line with the a–morphous morphology and distributed morphology perspectives in the language science (e.g., Anderson, 1992; Baayen, 2011; Bybee, 1985; Halle, 1990, 1997; Milin et al., 2017). More precisely, these results support the idea of the non–existence of the influence of the

single morphemes characteristics in the processing of deverbal nominals. One of the most interesting parts of the results obtained in the Experiment 1 is the fact that there are no differences in the processing time of derived nouns with zero–morpheme (derived nouns with only the root) and regular suffix (*–nje*). This could be one of the most prominent pieces of evidence that a–morphous perspective is present in the lexical processing even in the case of derivational morphology, hence confirming the importance of syntactic and semantics characteristics in the processing of deverbal nominals (the one that is highly controlled in this study). Furthermore, the results from the Experiment 2 and Experiment 3 go in line with those results. In case of the Experiment 2, the results suggest that there are no differences in the processing of process and result nominals that differ in the presence of the affix *–va*. Those results also support the a–morphous perspective in the language processing, and go in line with the previous finding that additional morphemes (infixes in this particular case) do not affect the lexical processing time. The final results of the Experiment 3 suggest that there are no differences in the processing time of deverbal nominals that differ in type of deverbal suffix in which they end. Once again, these results are consistent with the a–morphous perspective in the language processing, and confirm the idea of this perspective which suggests that the characteristics of single morphemes (e.g., suffix frequency, suffix ambiguity, suffix length etc.) do not affect the morpho–lexical processing, especially not when the semantic and syntactic characteristics are highly controlled. Thus, this research undoubtedly supports an a–morphous perspective in the case of cognitive processing of deverbal nominals in Serbian. Also, all the mentioned results are coherent with the distributed morphology (Halle, 1990, 1997), a perspective from the theoretical linguistics, which is complementary to the a–morphous morphology language perspective (Anderson, 1992; Bybee, 1985).

Conclusion

Taken together, the results observed in this study suggest that the cognitive processing of deverbal nominals in Serbian is not affected by the morphological differences of deverbal nominals itself. Moreover, these results go in line with the previous studies that highlight the importance of semantic and syntactic differences in the processing of deverbal nominals in Serbian, and propose the idea that the morphological features of deverbal nominals are not of crucial importance for the appearance of differences in the processing time of process and result deverbal nominals in Serbian (Gatarić et al., 2019; Radman, 2015). Furthermore, these results go in line with the a–morphous perspective in the lexical processing, as well as with the distributed morphology perspective from theoretical linguistics, therefore provoking the traditional view in the morpho–lexical processing.

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DA LI MORFOLOŠKE ODLIKE UTIČU NA KOGNITIVNU OBRADU DEVERBALNIH IMENICA U SRPSKOM JEZIKU?

Cilj ove studije bio je da se ispita da li različite morfološke karakteristike srpskih deverbalnih imenica utiču na njihovu leksičku obradu. Prema morfološkim razlikama, postoje tri podvrste procesnih i rezultativnih deverbalnih imenica u srpskom jeziku: (i) rezultativne imenice koje se završavaju nultim sufiksom, dok se procesne imenice završavaju deverbalnim sufiksom –nje (npr. žubor/žuborenje [eng. burble]); (ii) rezultativne imenice se razlikuju od procesnih u prisustvu infiksa –va (npr. rešenje/rešavanje [eng. solution]); (iii) procesne imenice se završavaju deverbalnim sufiksom –nje, dok se rezultativne završavaju nekim drugim derivacionim sufiksima (npr. rotiranje/rotacija [eng. rotation]). Finalni rezultati tri eksperimenta sa zadatkom čitanja slobodnim tempom pokazuju da različite morfološke odlike ne utiču na obradu deverbalnih imenica, što podržava a–morfni pristup morfo–leksičkoj obradi, kao i distributivno–morfološku perspektivu iz oblasti teorijske lingvistike.

Ključne reči: a–morfna morfologija, derivirane imenice, deverbalna nominalizacija, distributivna morfologija, morfo–leksička obrada

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RAZVOJ FONOLOŠKE SVESNOSTI KOD DECE UZRASTA OD ŠEST DO OSAM GODINA[2]

Cilj istraživanja je utvrđivanje nivoa razvijenosti elemenata fonološke svesnosti i uzajamnog odnosa tih elemenata kod dece tipičnog razvoja. Istraživanjem je obuhvaćeno 60-oro dece, oba pola (51.6% dečaka i 48.4% devojčica), uzrasta od šest (33.3%), sedam (38.3%) i osam (28.3%) godina. Za procenu fonološke svesnosti primenjen je revidirani FONT test, koji obuhvata osam tipova zadataka. Rezultati pokazuju generalno visoko postignuće dece na svim tipovima zadataka za procenu fonološke svesnosti (u rasponu od 73.3% do 90.8% uspešnosti). Međutim, moguće je diferencirati relativno lakše zadatke (spajanje slogova, prepoznavanje rime, slogovna segmentacija i identifikovanje početnog fonema) od relativno težih zadataka (identifikovanje završnog fonema, fonemska segmentacija, fonemska supstitucija početnog fonema i eliminacija početnog fonema). Teži tipovi zadataka su pokazali i međusobno snažniji intenzitet korelacije, dok su lakši tipovi zadataka slabije povezani sa ostalim zadacima u okviru testa (zbog suženog opsega raspona vrednosti, odnosno vrlo visokih prosečnih postignuća dece). Uzrasne razlike među decom su utvrđene samo na težim tipovima zadataka, dok su na lakšim zadacima već i šestogodišnjaci ostvarili postignuće kao i deca uzrasta sedam i osam godina. Rezultati su pokazali da se fonološke sposobnosti razvijaju i stiču do uzrasta od sedam godina. Pol, kao i interakcija pola i uzrasta, nisu predstavljali značajan izvor razlika u postignuću dece na zadacima fonološke svesnosti. Dobijeni nalazi sugerišu da je prilikom ispitivanja fonološke svesnosti kod dece tipičnog razvoja, već na uzrastu od šest godina dovoljno meriti samo postignuće na četiri tipa zadataka, koji su u istraživanju identifikovani kao teži.

Ključne reči: deca tipičnog razvoja, fonološka svesnost, uzrasne razlike

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Uvod

Uspešnost na zadacima čitanja i pisanja kod dece uslovljena je razvijenošću sistema fonološke obrade (Bryant & Goswami, 1987). Koncept o intaktnosti fonološke obrade, kao jedan od najvažnijih prediktora sposobnosti čitanja, nalazi se u osnovi teorija fonološkog deficita kod dece sa razvojnom disleksijom (Golubović, 2011; Ramus et al., 2003; Snowling, 1998). Termin fonološka obrada obuhvata širok opseg fonoloških procesa koji su neophodni za percepciju govornog ili pisanog jezika. Efikasna fonološka obrada podrazumeva sposobnost percepcije osnovnih segmenata govornog jezika: fonema, slogova i reči (Siok, Jin, Fletcher, & Tan, 2003; Wandell, Rauschecker, & Yeatman, 2012). Istraživanja ukazuju na postojanje tri međusobno povezane sposobnosti fonološke obrade: fonološka radna memorija, pristup fonološkim kodovima iz memorije i fonološka svesnost (Anthony & Francis, 2005).

Fonološka memorija podrazumeva privremeno skladištenje verbalnih informacija u obliku sekvence glasova, predstavljajući tako fonološku petlju u okviru koncepta radne memorije (Baddeley, 2012). Fonološka petlja zadržava verbalne informacije u ograničenom periodu pomoću mehanizma subvokalnog ponavljanja, što se može proveriti na zadacima raspona brojeva, dok se efikasnost pristupa fonološkim kodovima iz memorije može proveriti zadacima brzog imenovanja (Anthony, Williams, McDonald, & Francis, 2007). Za razliku od kratkoročne memorije, koncept radne memorije, pored skladištenja, podrazumeva i procese obrade informacija (Baddeley, 1982) i na taj način utiče na uspešnost dece na zadacima fonološke svesnosti, kao što su zadaci fonemske kategorizacije (Oakhill & Kyle, 2000) i eliminacije fonema (Leather & Henry, 1964).

Pristup fonološkim kodovima podrazumeva efikasnost u pronalaženju fonoloških kodova iz memorije (Anthony & Francis, 2005). S obzirom na to da su na teorijskoj osnovi semantički i fonološki nivo jezičkog sistema konceptualizovani kao suštinski različiti, unutar ovog okvira se pretpostavlja da je fonološko kodiranje ograničeno na samo jednu leksičku jedinicu i da nema uticaja na prethodni leksički nivo (Levelt, 1989, prema Damian & Martin, 1999).

Fonološka svesnost, kao sposobnost glasovne segmentacije i poznavanja odnosa slovo-glas (svest o glasovima neke reči), predstavlja osnovu funkcionisanja svakog jezika (Rathvon, 2004; Snow, Burns, & Griffin, 1998). Fonološka svesnost se može shvatiti kao multidimenzionalni konstrukt, grupišući tako veći broj funkcija koje doprinose razumevanju i preciznoj automatizovanoj primeni fonetskog sistema jezika, kao što su: auditivna percepcija, auditivna diskriminacija, auditivna diferencijacija, auditorna analiza, auditorno kombinovanje, auditorna memorija, pravilna i kontinualna auditorna klasifikacija, auditorni oblik ili auditorno raspoznavanje reči, formiranje rima, aliteracije i intonacija ili akcenat (videti Golubović, 2003, 2004, 2011, 2016, 2017a, 2017b). Navedena klasifikacija funkcija fonološke svesnosti procenjuje se kao sveobuhvatna (Golubović, 2017a) i, kao takva, predstavljala je referentni okvir za konstrukciju instrumenta primenjenog u ovom istraživanju.

Razvoj fonološke svesnosti se odvija intenzivno kod dece predškolskog uzrasta. Rezultati istraživanja ukazuju na to da uspešnost na zadacima fonološke svesnosti na predškolskom uzrastu predstavlja značajan prediktor čitalačkih veština kod dece sa i bez jezičkih poremećaja, u različitim jezicima i kulturama, uprkos međusobnim razlikama u jezičkoj strukturi (Franc & Subotić, 2015; Harris & Beech, 1998; Hulme et al., 2002; Kim, Kim, & Lee, 2007; Sprugevica & HØien, 2003; Villalón, 2008).

Istraživanja pokazuju da deca predškolskog uzrasta i tipičnog razvoja u najvećoj meri uspešno rešavaju zadatke slogovne segmentacije i rime. Tako je fonološka svesnost na zadacima slogovne segmentacije obično prisutna na uzrastu između treće i četvrte godine, dok je sposobnost rimovanja razvijena kod dece na uzrastu između četvrte i pete godine (Goswami & Bryant, 1990; Goswami & East, 2000). Sposobnost rimovanja, praćena razvojem sposobnosti analize prvog glasa u rečima, predstavlja prvu fazu u razvoju fonološke svesnosti kod dece na predškolskom uzrastu (Bradley & Bryant, 1983). U sada već klasičnom istraživanju fonološke svesnosti na zadacima slogovne segmentacije, Liberman i saradnici (Liberman, Shankweiler, Fischer, & Carter, 1974) su deci uzrasta od četiri do šest godina dali zadatak da jedanput udare rukom o sto kada ispitivač izgovori jednosložnu reči (npr. pas; engl. dog), dva puta udare rukom za dvosložnu reči (npr. jutro; engl. morning) i tri puta udare rukom za reči koje sadrže tri sloga (npr. krastavac; engl. cucumber). Nijedan četvorogodišnjak nije bio uspešan na opisanom zadatku, za razliku od 17% petogodišnjaka koji su uspešno rešili zadatak i 70% šestogodišnjaka koji su dostigli kriterijum od šest uzastopno tačnih odgovora. Kerol i Snouling (Carrol & Snowling, 2001) ispitujući fonološku svesnost četvorogodišnjaka kroz zadatke rimovanja i fonemske segmentacije, izveli su zaključak da postoji „prirodna superiornost rime u odnosu na razvoj fonemske segmentacije" (p. 339). Objašnjenje autora bilo je da se razvoj fonoloških sposobnosti odvija od većih ka manjim jezičkim jedicama (reč-slog-morfema-fonema). Ideja o univerzalnom razvojnom sledu od većih ka manjim jezičkim jedinicama uobličena je u psiholingvističkoj teoriji Ziglera i Gosvamijeve (Ziegler & Goswami, 2005), prema kojoj se razvoj fonološke svesnosti posmatra na kontinuumu, gde se sa uzrastom povećava osetljivost deteta na sve manje i manje jedinice jezičkog sistema (Anthony, Lonigan, Driscoll, Phillips, & Burgess, 2003; Fox & Routh, 1975; Liberman et al., 1974; Treiman, 1983). Prema ovom obrascu razvoja, na najmlađem uzrastu deca najpre detektuju reči, zatim slogove, a najzad i foneme, što odgovara hijerarhijskom modelu strukture reči (Goswami & Bryant, 1990; Wolff & Gustafsson, 2015). U jednom od istraživanja fonološkog razvoja, rezultati su ukazali na to da su četvorogodišnjaci uspešni na zadacima slogovne, ali ne i fonemske segmentacije, kao i na to da su na uzrastu od oko sedam godina deca u stanju da izvrše oba zadatka (Foss & Swinney, 1973).

Sa druge strane, postoje autori koji tvrde da se svesnost o fonemama razvija pre, a ne nakon razvoja sposobnosti prepoznavanja i produkcije rime i ostalih sposobnosti u okviru multidimenzionalnog konstrukta fonološke svesnosti (Duncan, Seymour, & Hill, 1997; Hulme, 2002; Seymour, Duncan, & Bolik, 1999). Ovu

tvrdnju Dankan i saradnici (Duncan et al., 1997) potkrepljuju istraživanjem na uzorku petogodišnjaka, u kom su deca imala zadatak da naglas izgovore koji su to glasovi zajednički za određene parove reči (primer na srpskom jeziku: pas-peh). Uspešnost dece na parovima reči koje se rimuju je iznosio 14%, za razliku od 44% uspešnosti u parovima reči sa zajedničkim inicijalnim glasom. Ovom gledištu su se suprotstavili određeni autori (Bertelson, de Gelder, & Van Zon, 1997; Geudens & Sandra, 2003), smatrajući da su zadaci iz Dankanovog (Duncan et al., 1997) istraživanja bili previše „konfuzni" za decu. Geudens i Sandra (Geudens & Sandra, 2003) su, ispitujući sposobnost fonološke svesnosti, utvrdili prednost rimovanja nad zadacima fonemske segmentacije kod dece predškolskog uzrasta, pri čemu su na zadacima fonemske segmentacije deca bila najuspešnija ako je početni glas u rečima bio iz grupe ploziva (71%) ili frikativa (70%). Drugi obrazac razvoja fonološke svesnosti podrazumeva da deca najpre detektuju fonemski slične reči, nakon čega sledi proces segmentacije i spajanja fonema, a zatim i proces manipulisanja fonemama kroz zadatke izostavljanja i supstitucije (Anthony et al., 2003; Seymour & Evans, 1994).

Jedan od operacionalnih modela, odnosno testova fonološke svesnosti, koji je namenski razvijen na srpskom govornom području i koji je u upotrebi u široj govornoj regiji (npr. Franc & Subotić, 2015; Subotić, 2011) jeste FONT test. U prvobitnoj verziji, FONT je obuhvatao sedam podtestova, odnosno tipova zadataka, koji su se odnosili na specifične sposobnosti fonološke svesnosti. Na referentnom uzorku dece uzrasta od pet do devet godina (Subotić, 2011), utvrđeno je da zadaci ispitivanja sposobnosti spajanja slogova predstavljaju najlakše zadatke za decu. Ova sposobnost se registruje već kod petogodišnjaka koji odgovarajuće zadatke rešavaju sa 68.5% uspešnosti. Nešto teži za ovladavanje petogodišnjacima su zadaci prepoznavanja rime (56.8% uspešnosti), a zatim zadaci identifikovanja početnog fonema (52.5% uspešnosti). Na kompletnom uzorku zadatak prepoznavanja rime zapravo je bio neznatno teži (73.5% uspešnosti) u odnosu na zadatak identifikovanja početnog fonema (78.7% uspešnosti). Osim toga, zadaci fonemske segmentacije se uspešno rešavaju u istom procentu kao i zadaci prepoznavanja rime (73.5%), iako je uspešnost na zadacima fonemske segmentacije bila znatno niža u poduzorku petogodišnjaka (33.5%).

Zadaci višeg nivoa kompleksnosti odnosili su se na identifikovanje završnog fonema (61.3%), što su petogodišnjaci uspešnije rešavali u odnosu na zadatke fonemske segmentacije (43.8%). Naposletku, deca su najteže ovladavala zadacima eliminacije početnog fonema i fonemske supstitucije (početnog fonema), gde je uspešnost za celokupan uzorak iznosila 43.5%, dok je na mlađim uzrastima eliminacija početnog fonema bila teža od fonemske supstitucije početnog fonema (petogodišnjaci su prvu vrstu zadataka uspešno rešavali u 1.2% slučajeva, a drugu u 7.3% slučajeva; šestogodišnjaci su prvu vrstu zadataka uspešno rešavali u 19.8% slučajeva, a drugu u 28.2 % slučajeva).

U radnoj reviziji FONT-a, koji postoji u srpskoj i hrvatskoj verziji zastupljen je i opcioni osmi podtest (slogovna segmentacija) namenjen ispitivanju dece mlađih

uzrasta. FONT model je konceptualizovan u skladu sa multidimenzionalnim shvatanjem fonološke svesnosti, i kao takav nudi mogućnost utvrđivanja opšte mere razvijenosti fonološke svesnosti, ali i pojedinačnih mera koje se odnose na stepen razvijenosti specifičnih aspekata fonološke svesnosti. Iako postoji preporuka da je u istraživanjima prikladno koristiti ukupni skor sa testa (Subotić, 2011), u ovom istraživanju su posmatrane razlike i uzajamni odnosi pojedinačnih elemenata fonološke svesnosti.

Cilj ovog istraživanja bio je utvrđivanje nivoa razvijenosti i uzajamnog odnosa različitih elemenata fonološke svesnosti u skladu sa revidiranim FONT modelom (Franc & Subotić, 2015) kod dece sa srpskog govornog područja, tipičnog razvoja, uzrasta od šest do osam godina.

Metod

Uzorak

Uzorak istraživanja činilo je 60 dece tipičnog razvoja, oba pola (51.6% dečaka i 48.4% devojčica), uzrasta od (najmanje) šest do osam (pre navršenih devet) godina (*AS* = 7.5; *SD* = 0.4). U odnosu na uzrast, uzorak dece je podeljen na tri grupe. Najmlađu grupu činilo je 20 šestogodišnjaka (33.3%). U drugoj uzrasnoj grupi je bilo 23 sedmogodišnjaka (38.3%), dok je treću grupu činilo 17 osmogodišnjaka (28.3%). Uzorak je ujednačen prema parametrima uzrasta i pola, $\chi^2(2) = 0.10$, $p = .95$, $w = .04$. Kriterijumi za uključivanje dece u uzorak podrazumevali su: odsustvo senzornih i motoričkih poremećaja, uredan emocionalni i socijalni razvoj, kao i najmanje prosečan nivo intelektualnog funkcionisanja deteta. Ove informacije su utvrđene na osnovu dostupne psihološke dokumentacije.

Istraživanje je obavljeno tokom aprila i maja meseca 2017. godine u Beogradu.

Instrumenti

FONT test (Subotić, 2011). Ovaj test je korišćen kao mera fonološke svesnosti. Korišćena je revidirana verzija testa (Franc & Subotić, 2015), u formi namenjenoj srpskom govornom području, koja obuhvata osam subtestova: 1) spajanje slogova, 2) slogovna segmentacija (opcioni podtest), 3) identifikovanje početnog fonema, 4) prepoznavanje rime, 5) fonemska segmentacija, 6) identifikovanje završnog fonema, 7) eliminacija početnog fonema i 8) fonemska supstitucija (početnog fonema). Svaki subtest sadrži po šest zadataka. Svi zadaci u okviru testa se detetu zadaju usmenim putem, dok ispitivač (logoped) beleži tačnost odgovora, po principu tačno-netačno. Izostanak odgovora se tretira kao netačan odgovor (za više informacija o sadržaju zadataka pogledati Subotić (2011)). Instrument ima dobru pouzdanost tipa interne konzistencije (Cronbachova $\alpha = .84$).

Obrada podataka

Pored mera deskriptivne statistike, prilikom obrade podataka korišćeni su koeficijenti produkt-moment linearnih korelacija (*r*), kao i koeficijenti rang-korelacija (ρ), *t*-testovi za zavisna merenja i jedan uzorak, kao i 2x3 (pol x (tri) uzrasne kategorije) dvofaktorska MANOVA, sa serijom naknadnih ANOVA testova. S obzirom na činjenicu da je vršen veliki broj statističkih komparacija, zbog čega se povećava verovatnoća za javljanje tzv. falš-pozitiva, vršena je i korekcija *p* verovatnoća putem FDR (engl. False Discovery Rate; Benjamini & Hochberg, 1995) postupka. Verovatnoće su podrazumevano korigovane za sve analize koje su podrazumevale više od tri komparacije/efekta. Za FDR korigovane verovatnoće u radu je korišćena oznaka p_{kor}. Izuzetak od ove procedure korekcije predstavljaju ANOVA post hoc testovi, koji su zasnovani na Bonferroni postupku, koji već uključuje vrstu kontrole falš-pozitiva. Ova kontrola podrazumeva množenje „sirovih" *p* statistika brojem vršenih komparacija. U radu su prikazane samo ove korigovane, ne i polazne *p* vrednosti (za ovako korigovane post hoc *p* statistike nije korišćena posebna oznaka).

Treba naglasiti da svi FONT subtestovi imaju šestostepeni raspon mogućih odgovora (od 0 do 6 tačnih odgovora). S obzirom na ovako mali broj numeričkih vrednosti i zbog izvesne zakrivljenosti distribucija postignuća dece iz uzorka na nekim subtestovima, razmotrena je mogućnost upotrebe odgovarajućih neparametrijskih testova. Međutim, kako su dobijeni funkcionalno ekvivalentni nalazi, u radu su prikazani samo rezultati parametrijskih testova, uz izuzetak korelacionih analiza, za koje su prikazane i parametrijske i rang-korelacije.

U istraživanju je identifikovano i jedno dete, koje se može smatrati multivarijatnim autlajerom, uz dva deteta koja su graničnog autlajer statusa (Tabachnick & Fidell, 2013). Kako analize sprovedene sa i bez ove dece upućuju na funkcionalno identične zaključke, deca su zadržana u uzorku.

Rezultati i diskusija

Prosečna postignuća po zadacima fonološke svesnosti

U Tabeli 1 prikazani su rezultati postignuća dece za FONT subtestove, na nivou celokupnog uzorka. Najviše prosečne vrednosti deca su ostvarila na sledećim tipovima zadataka: spajanje slogova (90.8% uspešnosti), slogovna segmentacija (90.5% uspešnosti) i prepoznavanje rime (90.5% uspešnosti). Navedeni subtestovi su se za decu iz našeg uzorka pokazali kao najlakši, u prilog čemu govori prosečan broj ostvarenih poena, koji je blizu maksimalne vrednosti, dok relativno niske vrednosti standardnih devijacija ukazuju na mali stepen disperzije rezultata među decom iz uzorka. Prednost na zadacima rimovanja i slogovne segmentacije u odnosu na razvijenost ostalih elemenata fonološke svesnosti navodi se i u re-

zultatima istraživanja drugih autora (Geudens & Sandra, 2003; Gombert, 1992; Jusczyk, 1977; Lewkowicz, 1980; Stanovich et al., 1984). Sa druge strane, prema rezultatima Subotića (2011), prepoznavanje rime je bilo neznatno teže u odnosu na identifikovanje početnog fonema. Ipak, treba istaći da se prosečni skorovi na prva četiri subtesta ne razlikuju značajno između sebe (svi $p_{kor} > .05$).

Tabela 1
Deskriptivni pokazatelji postignuća dece na FONT subtestovima

FONT podtestovi (tipovi zadataka)	*Min*	*Max*	*AS*	$\%_{usp}$	*SD*
Spajanje slogova	4	6	5.45	90.8	0.67
Slogovna segmentacija	0	6	5.43	90.5	1.00
Identifikovanje početnog fonema	0	6	5.23	87.2	1.21
Prepoznavanje rime	3	6	5.43	90.5	0.77
Fonemska segmentacija	0	6	4.93	82.2	1.34
Identifikovanje završnog fonema	3	6	4.98	83.0	0.87
Eliminacija početnog fonema	0	6	4.40	73.3	1.65
Fonemska supstitucija (početnog fonema)	1	6	4.87	81.2	1.23

Napomene. Min – minimalna vrednost; *Max* – maksimalna vrednost; *AS* - aritmetička sredina; $\%_{usp}$ - procent uspešnosti (AS/6*100); *SD* - standardna devijacija. Statistički značajne razlike (nakon korekcije verovatnoća) između individualnih parova podtestova (označenih brojevima) su: 1>5, 1>6, 1>7, 1>8, 2>5, 2>6, 2>7, 2>8, 3>7, 3>8, 4>5, 4>6, 4>7, 4>8, 5>7, 6>7 i 7<8.

Zadaci identifikovanja početnog fonema su za decu predstavljali neznatno lakši tip zadataka (87.2% uspešnosti) u odnosu na zadatke identifikovanja završnog fonema (83% uspešnosti). Raniji nalazi sugerišu da zadaci koji uključuju manipulaciju završnim fonemama više opterećuju kapacitete radne memorije u odnosu na početne foneme, pa je i uspešnost dece na tim zadacima tipično niža (Panić i Đorđević, 2015; Stanovich et al., 1984). Međutim, dobijena razlika u našem slučaju se može okarakterisati kao marginalno niska (Cohen, 1992) i statistički nenačajna, $t(59) = 1.49$, $p_{kor} = .21$, $d = 0.19$.

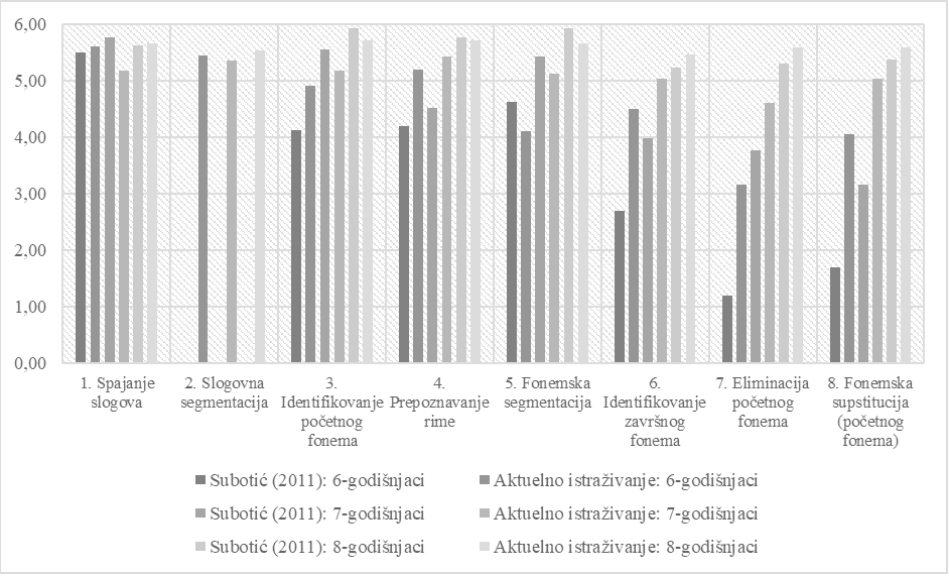
Zadatak fonemske segmentacije se za decu iz našeg uzorka pokazao kao statistički značajno teži tip zadatka (82.2% uspešnosti) u odnosu na zadatke: slogovne segmentacije, $t(59) = 2.60$, $p_{kor} = .02$, $d = 0.33$, spajanja slogova, $t(59) = 2.67$, $p_{kor} = .02$, $d = 0.34$, i prepoznavanja rime, $t(59) = 3.19$, $p_{kor} = .00$, $d = 0.41$. Ove razlike su generalno nižeg intenziteta, uz komentar da se razlika u odnosu na prepoznavanje rime približava umerenoj veličini efekta (Cohen, 1992). Skorovi na ovom subtestu su bili neznatno viši i u odnosu na identifikovanje početnog fonema, $t(59) = 1.85$, $p_{kor} = .11$, $d = 0.24$, i identifikovanje završnog fonema, $t(59) = 0.36$, $p_{kor} = .81$, $d = 0.05$, ali ove razlike nisu bile statistički značajne. Raspon rezultata

dece na zadatku fonemske segmentacije kreće se od minimalnog (0) ka maksimalnom uspehu (6), što uz relativno visoku vrednost standardne devijacije ukazuje na to da postoji jedan određen broj dece kod koje ova sposobnost još uvek nije u dovoljnoj meri razvijena. Imajući u vidu da sposobnost fonemske segmentacije podrazumeva integraciju funkcija auditivne diferencijacije, auditivne percepcije i memorije, kao i da predstavlja jedan od glavnih pokazatelja sposobnosti čitanja (Munoz, Valenzuela, & Orellana, 2017), nešto niži rezultati dece u ovom slučaju su očekivani, budući da, obzirom na uzrasne grupe jedan određen broj dece još uvek nije savladao sposobnost čitanja.

Rezultati ukazuju na to da su za decu iz našeg uzorka najteži tipovi zadataka bili zadaci eliminacije početnog fonema (73.3% uspešnosti) i zadaci fonemske supstitucije (početnog fonema) (81.2% uspešnosti). Zadatak eliminacije početnog fonema bio je statistički značajno teži zadatak u odnosu na sve ostale tipove zadataka, dok je zadatak fonemske supstitucije (početnog fonema) bio značajno teži od prva četiri zadatka. Naročito ističemo činjenicu da je zadatak eliminacije početnog fonema za decu iz našeg uzorka predstavljao teži tip zadatka u odnosu na zadatak fonemske supstitucije (početnog fonema). Intenzitet ove razlike se može okarakterisati kao niži, ali blizu umerenog (Cohen, 1992), $t(59) = -3.13$, $p_{kor} = .01$, $d = 0.40$. Ovo je delimično u skladu i sa istraživanjem samog autora FONT testa (Subotić, 2011), jer iako su na ukupnom uzorku postignuća na ova dva testa bila slična, zadatak eliminacije početnog fonema je bio teži (makar i neznatno) kod četiri od pet uzrasnih grupa. Pretpostavljamo da je sam zadatak eliminacije u odnosu na zadatak supstitucije za decu nešto apstraktniji i kognitivno složeniji, imajući u vidu da uključuje angažovanost samo auditivne memorije, bez učešća vizuelnog sistema podrške, te da podrazumeva promenu duže reči u kraću reč, koja je već sadržana u dužoj reči, ali to nije nužno na prvi pogled očigledno (npr. Jovan-ovan, grana-rana). Sa druge strane, supstitucija fonema ne podrazumeva promenu dužine reči (npr. Niš-miš, novac-lovac) pa su s tim u vezi i rezultati na podtestu eliminacije početnog fonema niži, posmatrano iz ugla prosečnih vrednosti. Zadaci kao što su eliminacija ili supstitucija početnog fonema, od dece zahtevaju eksplicitno razumevanje i percepciju zvučnih segmenata koje čine reči, te su kognitivni procesi u ovom slučaju generalno zahtevniji za decu u odnosu na sve ili većinu drugih zadataka iz testa. Shodno tome, pretpostavlja se da bi viši uspeh dece na zadacima ovog tipa potencijalno mogao da predstavlja dobar pokazatelj za kasniji uspeh u savladavanju čitanja i pisanja.

Direktne komparacije sirovih skorova po uzrasnim grupama sa vrednostima iz istraživanja Subotića (2011) prikazane su na Slici 1. Napominjemo da komparacija po subtestu slogovne segmentacije nije bila moguća, zbog toga što ona nije bila uključena u verziju FONT-a u istraživanju Subotića (2011); uspešnost u slogovnoj segmentaciji je prikazana samo za tri uzrasne grupe iz aktuelnog istraživanja. Na šestogodišnjem uzrastu, u odnosu na vrednosti iz istraživanja Subotića (2011), deca iz ovog istraživanja ostvaruju više skorove na subtestovima prepoznavanja rime, $t(19) = 5.42$, $p_{kor} < .01$, $d = 2.49$, identifikovanja završnog fonema, $t(19) =$

9.11, $p_{kor} < .00$, $d = 4.18$, eliminacije početnog fonema, $t(19) = 4.16$, $p_{kor} = .00$, $d = 1.91$, i fonemske supstitucije (početnog fonema), $t(19) = 6.58$, $p_{kor} < .00$, $d = 3.02$. Na uzrastu od sedam godina, deca iz našeg uzorka postižu očigledno više skorove na subtestovima prepoznavanja rime, $t(22) = 6.62$, $p_{kor} < .01$, $d = 2.82$, identifikovanja završnog fonema, $t(22) = 6.24$, $p_{kor} < .00$, $d = 2.66$, eliminacije početnog fonema, $t(22) = 5.20$, $p_{kor} < .00$, $d = 2.22$, i fonemske supstitucije (početnog fonema), $t(22) = 12.87$, $p_{kor} < .00$, $d = 5.49$, dok ostvaruju niže skorove na subtestovima spajanja slogova, $t(22) = -3.92$, $p_{kor} = .00$, $d = 1.67$, i identifikovanja početnog fonema, $t(22) = -2.32$, $p_{kor} = .06$, $d = 0.99$, uz komentar da je razlika u odnosu na subtest identifikovanja početnog fonema bila statistički značajna samo pre korekcije verovatnoće ($p = .03$), dok se nakon korekcije nalazi nešto izvan uobičajene konvencionalne granice od $p < .05$. Na uzrastu od osam godina, beleži se jedna uočljivija razlika, koja podrazumeva niže skorove dece iz ovog istraživanja na subtestu fonemske segmentacije, $t(16) = -2.28$, $p_{kor} = .06$, $d = 1.14$, pri čemu je i ova razlika značajna pre korekcije verovatnoće ($p = .03$), dok se nakon korekcije pomera nešto izvan konvencionalne granice od $p < .05$. Sve navedene razlike, bilo da su značajne ili su na granici značajnosti, predstavljaju efekte visokih intenziteta (Cohen, 1992).



Slika 1. Razlike u postignuću na FONT subtestovima po uzrasnim kategorijama, u odnosu na vrednosti iz istraživanja Subotića (2011). Na y-osi se nalazi uspešnost dece na prikazanim zadacima.

Uz nekoliko navedenih izuzetaka, može se konstatovati da deca iz ovog istraživanja ostvaruju najmanje podjednake, a tipično veće skorove od referentnih vrednosti iz istraživanja Subotića (2011), što je najuočljivije na subtestovima

identifikovanja završnog fonema, eliminacije početnog fonema i fonemske supstitucije (početnog fonema), na uzrastu od šest godina. Sličan zaključak se nameće i kada se, u skladu sa instrukcijama autora testa (Subotić, 2011), pored sirovog skora, u obzir uzmu i FONT ponderisani skorovi, kako bi se izdvojila deca čije je postignuće ispod proseka u odnosu na FONT uzrasne norme. Nijedno dete iz našeg uzorka ne ostvaruje individualni skor, koji je ispod granice proseka u odnosu na uzrasne norme.

Razlog globalno posmatrano višeg postignuća dece iz ovog uzorka u odnosu na vrednosti iz istraživanja Subotića (2011) verovatno se nalazi u činjenici da je u ovom istraživanju zahvaćen nešto širi uzrasni interval dece po kategorijama, dok su deca iz istraživanja Subotića (2011) bila mnogo bliža donjim granicama svojih uzrasnih kategorija. . Drugim rečima, deca iz našeg istraživanja su bila nešto starija u odnosu na decu iz istih uzrasnih kategorija iz studije Subotića (2011). Različite grupe dece definisane jednogodišnjim uzrasnim intervalom predstavljaju deo metodologije najvećeg broja istraživanja o razvoju fonološke svesnosti (Bentin, Hammer, & Cahan, 1991; Burgess, 1997; Lonigan, Burges, Anthony, & Barker, 1998; Metsala, 1999; Muter, Hulme, Snowling, & Taylor, 1998; Olofsson & Niedersøe, 1999; Sutherland & Gillon, 2006; Torgesen, Wagner, Rashotte, Burgess, & Hecht, 1997; Vloedgraven & Verhoeven, 2009; Wagner et al., 1997).

Korelaciona analiza elemenata fonološke svesnosti na FONT testu

U Tabeli 2 dati su rezultati bivarijacionih korelacija između svih FONT zadataka. Prikazane su samo vrednosti za kompletan uzorak.[3] Od mogućih 28 korelacionih parova FONT podtestova, utvrđeno je 15 (*r*), odnosno 17 (ρ) značajnih korelacija pre korekcije verovatnoća, tj. 12 (*r*), odnosno 17 (ρ) značajnih korelacija nakon korekcije. Slično rezultatima drugih istraživanja (Carroll, Snowling, Stevenson, & Hulme, 2003), visine korelacija obuhvataju raspon od niskih do visokih (Cohen, 1992), uz nešto veće vrednosti ρ u odnosu na *r* koeficijente.

Primetno je da se statistički značajne korelacije (odnosno: korelacije o kojima je moguće zaključivati sa konvencionalno dovoljno visokom sigurnošću) i korelacije višeg intenziteta, u skladu sa nalazima brojnih drugih istraživanja (Carroll et al., 2003; Hoien, Lundberg, Stanovich, & Bjaalid, 1995; Muter, Hulme, Snowling, & Taylor, 1998; Stanovich, Cunningham, & Cramer, 1984; Wallach & Wallach, 1976), češće javljaju između tipova zadataka koji se odnose na složenije elemente fonološke svesnosti. Ovi rezultati su, izvesno posledica kombinacije relativno visokog

[3] Razlike u korelacionim trendovima na uzrasnim podgrupama su razmotrene, ali ih uprkos naznakama nije bilo moguće precizno ustanoviti, zbog relativno male veličine uzrasnih podgrupa. Recimo, na poduzorku šestogodišnjaka, korelacija između spajanja slogova i identifikovanja početnog fonema iznosi *r*=.18 / ρ=.23, dok je korelacija ovih tipova zadataka na poduzorku osmogodišnjaka vidno veća i iznosi *r* = .80 / ρ=.85. Međutim, serija *Z*-testova (kojima se proveravaju razlike između visina korelacija za nezavisne uzorke) je pokazala da se ni u slučaju jednog korespodentnog para korelacija za tri uzrasne grupe, na ovom broju dece, ne može pouzdano odbaciti nulta hipoteza, odnosno sve razlike u visinama korelacija na različitim uzrastima se ne mogu, za sada, pouzdano pripisati ičemu osim slučajnog variranja.

prosečnog postignuća (kao i suženog opsega mogućih odgovora) na „lakšim“ zadacima za decu obuhvaćenog uzrasta i relativno malog broja dece (uz komentar da je broj dece u uzorku sličan uobičajenim veličinama uzoraka za istraživanja ovog tipa; npr. Carroll et al., 2003). Rezultati istraživanja se reflektuju kako na redukciju povezanosti lakših tipova zadataka sa težim, tako i na redukciju povezanosti lakših tipova zadataka između sebe.

Tabela 2
Korelacije FONT podtestova

FONT zadaci		1.	2.	3.	4.	5.	6.	7.	8.
1. Spajanje slogova	*r*\ρ	-	**.35***	**.34***	.11	.11	.14	.25	.06
	p	-	**.00**	**.00**	.39	.36	.28	.05	.60
2. Slogovna segmentacija	*r*\ρ	**.28**	-	**.30***	-.04	.00	-.01	-.08	.01
	p	**.02**	-	**.01**	.71	.98	.89	.52	.93
3. Identifikovanje početnog fonema	*r*\ρ	.20	.22	-	.24	**.37****	**.29***	**.35***	**.47*****
	p	.12	.08	-	.06	**.00**	**.02**	**.00**	**<.001**
4. Prepoznavanje rime	*r*\ρ	.04	-.09	.16	-	**.59*****	**.65*****	**.48*****	**.39****
	p	.74	.47	.21	-	**<.001**	**<.001**	**<.001**	**.00**
5. Fonemska segmentacija	*r*\ρ	-.00	.21	**.52*****	**.44*****	-	**.66*****	**.52*****	**.56*****
	p	.97	.10	**<.001**	**<.001**	-	**<.001**	**<.001**	**<.001**
6. Identifikovanje završnog fonema	*r*\ρ	.09	-.01	**.26**	**.56*****	**.59*****	-	**.62*****	**.42*****
	p	.45	.93	**.04**	**<.001**	**<.001**	-	**<.001**	**<.001**
7. Eliminacija početnog fonema	*r*\ρ	.11	.01	**.27**	**.33***	**.52*****	**.53*****	-	**.71*****
	p	.40	.90	**.03**	**.01**	**<.001**	**<.001**	-	**<.001**
8. Fonemska supstitucija (početnog fonema)	*r*\ρ	.03	.18	**.56*****	**.33***	**.65*****	**.36***	**.71*****	-
	p	.80	.15	**<.001**	**.00**	**<.001**	**.00**	**<.001**	-

Napomene. Vrednosti ispod dijagonale su Pirsonove produkt-moment linearne korelacije (*r*), dok su vrednosti iznad dijagonale Spirmanove rang-korelacija (ρ). Prikazane vrednosti *p* statistika date su pre korekcije verovatnoća, a svi značajni efekti pre korekcije su podebljani.
Zvezdice označavaju statistički značajne efekte nakon korekcije verovatnoća: $^{*}\, p_{kor} < .05$. $^{**}\, p_{kor} < .01$. $^{***}\, p_{kor} < .001$.

Primera radi, povezanost između spajanja slogova i slogovne segmentacije[4] u ovom istraživanju je niska do umerena. Oba ova podtesta su izrazito laka, sa skoro identičnim aritmetičkim sredinam. Međutim, spajanje slogova ima vrlo nisku standardnu devijaciju, pri čemu su zabeleženi samo skorovi 4 (10%), 5 (35%) i 6 (55%), bez vrednosti 0-3, dok se za slogovnu segmentaciju beleže odgovori 0 (1.7%)[5], 4 (11.7%), 5 (23.3%) i 6 (63.3%), bez prisutnih vrednosti 1, 2 i 3. Reč je o suviše niskoj varijabilnosti rezultata za pouzdaniju manifestaciju i detekciju snažnije veze, za šta bi bilo potrebno ili povećanje uzorka ili uključivanje mlađe dece, kod kojih ove sposobnosti nisu u potpunosti razvijene, čime bi se povećala količina varijanse odgovora i samim tim verovatno pojačala interkorelacija. Istovremeno, povećanje proporcije mlađe dece u uzorku ne bi nužno dovelo do pojačanja veze između lakših i težih tipova zadataka, pošto se opaženi izostanak ili redukcija takve veze, što je svojstveno i za druga istraživanja (npr. Carroll et al., 2003), može tumačiti principima kognitivnog razvoja. Naime, ako govorimo o sposobnosti spajanja slogova i slogovne segementacije specifično, one se javljaju kod dece uzrasta od oko četiri godine, dok se fonemska segmentacija i eliminacija početnih fonema dosledno javljaju tek kod nešto starije dece, onda kada su savladana pravila grafemsko-fonemske konverzije (Morais, Cary, Alegria, & Bertelson, 1979). Ipak, povezanost između subtestova spajanja slogova i slogovne segementacije u ovom istraživanju ne izostaje sasvim, što je i razumljivo, budući da se navedene sposobnosti teško mogu razmatrati odvojeno jedna od druge i predstavljaju jedan od najranijih pokazatelja sposobnosti čitanja kod dece predškolskog uzrasta (Helfgott, 1976).

Jedini „lakši" tip zadatka koji je ostvario sistematične veze sa „težim" tipovima zadataka, uprkos takođe prisutnom malom opsegu odgovora, jeste prepoznavanje rime. U jednom od ranijih istraživanja fonološke svesnosti (Bryant, MacLean, Bradley, & Crossland, 1990), uspeh na zadacima rimovanja je bio statistički značajno povezan sa svim procenjivanim elementima fonološke svesnosti i predstavljao je najznačajniji pokazatelj uspeha u čitanju. Prema našim rezultatima, subtest prepoznavanja rime je statistički značajno povezan sa uspehom dece na subtestovima: identifikovanja završnog fonema, fonemske segmentacije, eliminacije i supstitucije početnog fonema, što je u skladu sa istraživanjem drugih autora (Anthony & Lonigan, 2004).

Razmatrajući rezultate korelacione analize, moramo da naglasimo činjenicu da se kognitivni zahtevi za različite zadatke na testu fonološke svesnosti veoma razlikuju, te da nam korelaciona analiza zapravo daje samo grubu indikaciju ste-

[4] Radno smo ispitali i tendencije zajedničkog latentnog grupisanja FONT zadataka. Svi preporučeni postupci za odabir broja faktora/komponenti (Subotić, 2013) sugerisali su da je optimalno ekstrahovati jedan latentni faktor ili komponentu. Ističemo da upravo podtestovi spajanja slogova i (još naglašenije) slogovne segmentacije pokazuju vrlo niska zasićenja (Tabachnick & Fidell, 2013) na zajedničkoj latentnoj FONT dimenziji (bilo da je reč o faktoru ili komponenti), dok su ostali tipovi zadataka na njoj adekvatno zastupljeni.

[5] Ako se ukloni jedno dete sa odgovorom 0 na slogovnoj segmentaciji, korelacija ovog tipa zadatka sa spajanjem slogova iznosi: $r = .32$, odnosno $\rho = .33$.

pena do kog određeni zadaci predstavljaju sličan konstrukt u okviru sposobnosti fonološke svesnosti.

Uzrasne razlike u elementima fonološke svesnosti

Na osnovu rezultata istraživanja ustanovljeno je, da na nivou svih merenih tipova zadataka fonološke svesnosti posmatranih u kombinaciji, uzrast predstavlja glavnu determinantu razlike u prosečnim skorovima, $F(16, 94) = 2.40$, $\Lambda = .50$, $p = .00$, $\eta_p^2 = .29$, dok pol, $F(8, 47) = 1.45$, $\Lambda = .80$, $p = .20$, $\eta_p^2 = .19$, odnosno interakcija pola i uzrasta, $F(16, 94) = 0.92$, $\Lambda = .75$, $p = .55$, $\eta_p^2 = .13$, nisu statistički značajni faktori (svi $p > .05$). Rezultati naknadnih ANOVA testova su prikazani u Tabeli 3. Navedeni su efekti za sve nezavisne varijable (NV): pol, uzrast, kao i interakciju pola i uzrasta (tj. pol x uzrast), za svaku od osam zavisnih varijabli (ZV), koje predstavljaju elemente fonološke svesnosti.

Može se uočiti da iako pol ne predstavlja značajan faktor uspeha na zadacima fonološke svesnosti, postoje dva statistički značajna individualna efekta, koja podrazumevaju više skorove devojčica na subtestovima spajanja slogova i prepoznavanja rime. U oba slučaja, pol je objašnjavao po oko 8% varijanse postignuća na ovim tipovima zadatka. Međutim, nakon korekcije verovatnoća, efekti nisu ostali statistički značajni, što je u skladu s nalazima iz literature, pošto se uticaj pola na razvijenost fonoloških sposobnosti uglavnom ne identifikuje (Ball & Blachman, 1991; Dege & Schwarzer, 2011), premda postoji određeni broj istraživanja u kojima je zabeležena prednost devojčica (Berninger, Nielsen, Abbott, Wijsman, & Raskind, 2008; Lundberg, Larsman, & Strid, 2012).

Analizom rezultata utvrđena je i jedna naznaka interakcije pola i uzrasta, koja je podrazumevala više skorove šestogodišnjih dečaka na subtestu identifikovanja završnog fonema, ali i više skorove kod devojčica u preostale dve uzrasne grupe. Ova interakcija objašnjava nešto ispod 11% varijanse uspešnosti na navedenom tipu zadatka, ali takođe gubi statističku značajnost nakon korekcije verovatnoća.

Kada je reč o glavnom efektu faktora uzrasta, inicijalno se beleži pet značajnih razlika, od kojih se jedna gubi nakon korekcije verovatnoća. Efekat koji je prestao da bude značajan podrazumeva razlike u spajanju slogova (uzrast objašnjava oko 13% varijanse ove varijable), koje sugerišu da postoji blagi pad prosečnih skorova kod osmogodišnjaka, u odnosu na preostale dve uzrasne grupe. Međutim, nakon post hoc poređenja svake uzrasne grupe sa svakom, zapravo nijedna međugrupna razlika nije dostigla nivo značajnosti. U skladu sa navedenim činjenicama, može se konstatovati da je verovatno reč o slučajnom variranju, tj. da sve tri uzrasne grupe zapravo imaju slično visoko postignuće na ovom zadatku.

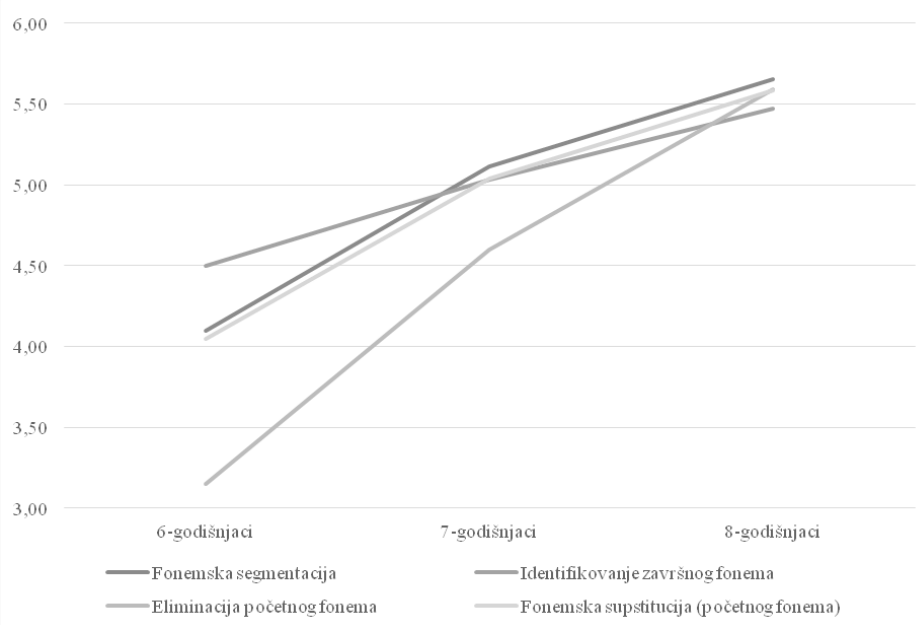
Tabela 3
Odnos između pola i uzrasta dece i uspešnosti na FONT podtestovima

Faktor (NV)	FONT podtestovi (ZV)	*F*	*p*	η_p^2
Pol	Spajanje slogova	4.67	**.03**	.08
	Slogovna segmentacija	0.02	.88	.00
	Identifikovanje početnog fonema	0.03	.86	.00
	Prepoznavanje rime	4.61	**.03**	.08
	Fonemska segmentacija	0.04	.84	.00
	Identifikovanje završnog fonema	0.01	.92	.00
	Eliminacija početnog fonema	0.00	.95	.00
	Fonemska supstitucija (početnog fonema)	0.06	.80	.00
Uzrast	Spajanje slogova	4.00	**.02**	.13
	Slogovna segmentacija	0.14	.89	.00
	Identifikovanje početnog fonema	2.02	.14	.07
	Prepoznavanje rime	2.29	.11	.08
	Fonemska segmentacija	8.08	**.001****	.23
	Identifikovanje završnog fonema	7.34	**.002***	.21
	Eliminacija početnog fonema	14.70	**<.001*****	.35
	Fonemska supstitucija (početnog fonema)	9.39	**<.001*****	.25
Pol *x* uzrast (interakcija)	Spajanje slogova	1.68	.19	.06
	Slogovna segmentacija	1.19	.31	.04
	Identifikovanje početnog fonema	0.02	.97	.00
	Prepoznavanje rime	0.31	.73	.01
	Fonemska segmentacija	1.35	.26	.04
	Identifikovanje završnog fonema	3.25	**.04**	.10
	Eliminacija početnog fonema	0.25	.78	.01
	Fonemska supstitucija (početnog fonema)	0.21	.81	.01

Napomene. Brojevi stepeni slobode NV su: 1) pol: *df* = 1, 2; uzrast: *df* = 2 i 3; pol x uzrast = 2. Broj stepeni slobode reziduala („greške“) je: *df* = 54. Prikazane vrednosti *p* statistika date su pre korekcije verovatnoća, a svi značajni efekti pre korekcije su podebljani. Zvezdice označavaju statistički značajne efekte nakon korekcije verovatnoća: * $p_{kor} < .05$. ** $p_{kor} < .01$. *** $p_{kor} < .001$.

Rezultati u vezi sa uzrasnim specifičnostima koji su ostali značajni i nakon korekcije podrazumevaju trend porasta prosečnih skorova na zadacima fonemske

segmentacije, identifikovanja završnog fonema, eliminacije početnog fonema i fonemske supstitucije (početnog fonema) sa uzrastom dece, koji objašnjava između 21.4% i 35.3% varijanse navedenih varijabli. Prosečno postignuće po uzrasnim grupama je prikazano na Slici 2.



Slika 2. Prikaz značajnih razlika u postignuću na FONT podtestovima po uzrasnim kategorijama.

Naknadnim poređenjima po parovima uzasnih grupa (Bonferroni post hoc testovi) utvrđene su sledeće značajne pojedinačne grupne razlike: 1) na zadacima fonemske segmentacije sedmogodišnjaci ostvaruju značajno više postignuće od šestogodišnjaka (p = .02), odnosno osmogodišnjaci ostvaruju značajno više postignuće od šestogodišnjaka (p < .001); 2) na zadacima identifikovanja završnog fonema, osmogodišnjaci ostvaruju značajno više postignuće od šestogodišnjaka (p = .00), dok je razlika između šestogodišnjaka i sedmogodišnjaka bila blizu konvencionalnom nivou značajnosti, ali ga nije prešla (p = .09); 3) na zadacima eliminacije početnog fonema sedmogodišnjaci su ostvarili značajno više postignuće od šestogodišnjaka (p = .00), odnosno osmogodišnjaci ostvaruju značajno više postignuće od šestogodišnjaka (p < .001), dok je razlika između sedmogodišnjaka i osmogodišnjaka bila blizu konvencionalnom nivou značajnosti, ali ga nije prešla (p = .09) i 4) na zadacima fonemske supstitucije (početnog fonema) sedmogodišnjaci su bili značajno uspešniji od šestogodišnjaka (p = .01), odnosno osmogodišnjaci su postizali značajno više postignuće od šestogodišnjaka (p < .001).

Na sva četiri tipa zadataka na kojima se deca iz tri uzrasne grupe statistički značajno razlikuju primetan je porast prosečnih skorova sa uzrastom. Ovo uključuje i blago više skorove osmogodišnjaka u odnosu na sedmogodišnjake, ali ni u jednom slučaju razlike između osmogodišnjaka i sedmogodišnjaka nisu dostigle nivo značajnosti. Tačnije, premda postoji izvestan trend porasta na uzrastu od osam, u odnosu na uzrast od sedam godina, on se ne može smatrati značajnim. S druge strane, šestogodišnjaci u odnosu na osmogodišnjake postižu značajno niže skorove na sva četiri zadatka, te značajno niže skorove u odnosu na sedmogodišnjake na tri od četiri zadatka (izuzev identifikovanja završnog fonema).

Prednost sedmogodišnjaka i osmogodišnjaka u odnosu na šestogodišnjake u pogledu veštine fonemske segmentacije je očekivana, jer se na predškolskom uzrastu ona još uvek razvija. Sa polaskom dece u školu, kada počinje sistematska obuka čitanja, fonemska segmentacija dostiže svoj puni razvoj, te nije začuđujući nalaz da nema razlike u uspešnosti među decom uzrasta od sedam i osam godina na ovim zadacima. Prema rezultatima istraživanja Libermana i saradnika (Liberman et al., 1974), na uzorku dece između četiri i šest godina fonemska segmentacija predstavlja značajno teži tip zadatka u odnosu na slogovnu segmentaciju. Time navedeni autori podržavaju zaključak da razvoj fonološke svesnosti teče postupno, od razvoja slogovne segmentacije ka fonemskoj segmentaciji, sa čim su funkcionalno saglasni i rezultati našeg istraživanja.

Kada je reč o nešto lošijem postignuću šestogodišnjaka na subtestu identifikovanja završnog fonema, niže postignuće mlađe dece u odnosu na decu starijeg uzrasta je očekivan, zbog povećanog opterećenja radne memorije na ovom tipu zadatka, koje je npr. veće u odnosu na opterećenje na formalno sličnom zadatku identifikovanja početnog fonema (Panić i Đorđević, 2015), na kom nisu utvrđene značajne uzrasne razlike. Niži skorovi šestogodišnjaka u odnosu na osmogodišnjake, ali ne i u odnosu na sedmogodišnjake, koji se istovremeno nisu razlikovali od osmogodišnjaka, sugeriše da se ovi deficiti redukuju negde na prelazu iz šeste u sedmu godinu.

U vezi sa razlikama na subtestovima eliminacije početnog fonema i fonemske supstitucije (početnog fonema), treba istaći da neke studije iz prethodnih decenija (npr. Bruce, 1964) sugerišu da se sposobnosti eliminacije i supstitucije fonema u rečima javljaju tek na uzrastu od oko osam godina, dok samo neznatan broj šestogodišnjaka uspeva da reši ovakve zadatke. Naši rezultati potvrđuju ovakve nalaze za eliminaciju početnog fonema, na kojoj su uzrasne razlike između grupa najočiglednije i najizrazitije, dok uzrasne razlike u pogledu fonemske supstitucije (početnog fonema) jesu prisutne, ali nisu toliko izražene, pošto već i šestogodišnjaci postižu relativno visoke prosečne skorove.

Razvoj fonološke svesnosti kod dece počinje na uzrastu od oko četiri godine, od svesti o slogovima, ka fonemskoj segmentaciji i rimi (Hoien et al., 1995; Kirtley, Bryant, MacLean, & Bradley, 1989; Treiman, 1985). Svesnost o početnim fonemama u rečima i rimi se tipično javljaju pre čitalačkih veština, omogućavajući na taj način deci da dekodiraju reči po analogiji, pre razvoja svesnosti o fonemskoj

segmentaciji (Goswami & Bryant, 1990). Onda kada deca počnu da koriste alfabet, može se govoriti o potpunoj razvijenosti fonološke svesnosti, a to se najčešće dešava na uzrastu od oko sedam godina (Read, Zhang, Nie, & Ding, 1986). Naši nalazi su sasvim u skladu sa opisanim trendovima, jer funkcionalne razlike u prosečnim skorovima na svim merenim tipovima zadataka, uključujući i najteže (fonemska segmentacija, identifikovanje završnog fonema, eliminacija početnog fonema, fonemska supstitucija (početnog fonema)), uglavnom iščezavaju između sedme i osme godine, dok na lakšim tipovima zadataka (spajanje slogova, slogovna segmentacija, identifikovanje početnog fonema, prepoznavanje rime) već i šestogodišnjaci pokazuju relativno visoko postignuće, koje se funkcionalno ne razlikuje od postignuća dece starijeg uzrasta.

Generalna diskusija

Nalazi istraživanja ukazuju na nekoliko glavnih implikacija. Kada je reč o težini ispitivanih subtestova, tj. zadataka fonološke svesnosti po proširenom, tj. revidiranom (Franc & Subotić, 2015) FONT modelu (Subotić, 2011), na našem uzorku oni se očigledno mogu podeliti u grupe lakših i težih, iako je generalno postignuće dosta visoko u celini (u rasponu od 73.3% do 90.8% uspešnosti). U lakše tipove zadataka ubrajamo (počevši od najlakših): spajanje slogova, prepoznavanje rime, slogovna segmentacija i identifikovanje početnog fonema. U teže tipove zadataka ubrajamo (od lakših ka težim): identifikovanje završnog fonema, fonemsku segmentaciju, fonemsku supstituciju (početnog fonema) i eliminaciju početnog fonema. Teža grupa zadataka uključuje elemente fonološke svesnosti za koje se može sa sigurnošću pretpostaviti da angažuju više nivoe kognitivnih sposobnosti dece i da u većoj meri opterećuju kapacitete radne memorije (Golubović, 2011, 2016, 2017a).

Navedeni teži tipovi zadataka su bili i nešto snažnije interkorelirani u odnosu na veze koje ostvaruju sa lakšim tipovima zadataka, kao i u odnosu na veze koje lakši tipovi zadataka ostvaruju među sobom, verovatno zbog sniženog opsega variranja vrednosti lakših tipova zadataka. Treba naglasiti da se mnoge razlike u težini između tipova zadataka ne manifestuju kao značajne prilikom direktnih međusobnih poređenja prosečnih postignuća na individualnim tipovima zadataka (npr. zadaci iz grupe lakših se značajno ne razlikuju između sebe, tj. svi su sličnog stepena težine). Sa druge strane, neke razlike u težini su vrlo očigledne. Pre svega, to je slučaj sa težinom subtesta eliminacije početnog fonema, koji nesumnjivo predstavlja najteži zadatak za decu koja su obuhvaćena ovim istraživanjem, iako je i na njemu prosečno postignuće (na nivou kompletnog uzorka) iznosilo relativno visokih 73.3%. Uvažavajući određene razlike u uzorcima iz ovog istraživanja i referentnog istraživanja Subotića (2011), u kom razlika u težini između subtestova fonemske supstitucije (početnog fonema) i eliminacije početnog fonema nije bila toliko izražena, naši nalazi jasno ukazuju da bi subtest eliminacije početnog

fonema ipak trebalo posmatrati kao teži subtest i u skladu s tim, zadavati ga kao poslednji zadatak u okviru revidiranog FONT testa.

Uzrast se pokazao kao glavni faktor koji determiniše razlike u prosečnim postignućima na zadacima fonološke svesnosti, dok pol i interakcija pola i uzrasta nisu bili od značaja. Pri tome, već navedenim lakšim tipovima zadataka čak i šestogodišnjaci ovladavaju do nivoa koji se funkcionalno ne razlikuje od starije dece. Na navedenim težim fonološkim subtestovima, visoko postignuće se beleži na uzrastu od oko sedam godina, tj. prosečna postignuća sedmogodišnjaka i osmogodišnjaka se generalno ne razlikuju značajno (iako osmogodišnjaci postižu neznatno viši uspeh), dok su skorovi i osmogodišnjaka i sedmogodišnjaka (uz jedan izuzetak) značajno viši u odnosu na postignuće šestogodišnjaka. Na osnovu ovoga, sugerišemo da je, u slučaju testiranja dece tipičnog razvoja, već na uzrastu od šest godina, potencijalno moguće preskočiti prva četiri FONT subtesta (ili zadati samo neke individualne zadatke iz njih, zarad uspostavljanja kontakta sa detetom i ublažavanja treme) i dovoljno je fokusirati se samo na subtestove: identifikovanje završnog fonema, fonemska segmentacija, fonemska supstitucija (početnog fonema) i eliminacija početnog fonema. Samo u slučaju sumnje o postojanju deficita u razvoju fonološke svesnosti ili u slučaju testiranja mlađe dece, poželjno je zadavati prva četiri FONT tipa zadataka. Takođe, sugerišemo da bi prilikom ispitivanja uzrasnih razlika u fonološkim zadacima koje smo obuhvatili ovim istraživanjem, kao komparativnu jedinicu uzrasta verovatno primerenije bilo posmatrati interval koji je manji od godinu dana (npr. šest meseci ili čak tri meseca). Dinamika razvoja fonološke svesnosti je očigledno brža od onog što razmak od godinu dana može da pokaže, tj. jedinica promene aspekata fonološke svesnosti je izvesno manja od toga.

Ograničenja istraživanja

Jedan od potencijalno relevantnih faktora koji nije uzet u obzir u ovom istraživanju odnosi se na moguće efekte socioekeonomskog statusa (SES) na ostvarena prosečna postignuća po domenima fonološke svesnosti. Ranija istraživanja ukazuju na važnost SES-a, kako u izolaciji (Lundberg et al., 2012), tako i u interakciji sa uzrastom (McDowell, Lonigan, & Goldstein, 2007). Takođe, sva deca iz uzorka dolaze iz veće gradske sredine, tako da njihova prosečna postignuća nije opravdano direktno generalizovati na moguća postignuća dece iz manje urbanih sredina, bez prethodne eksplicitne empirijske provere. Ipak, iako sve navedeno potencijalno ograničava poređenje i generalizaciju proseka postignuća, verovatno je da se utvrđena podela na lakše i teže grupe zadataka ne menja, tj. očekuje se da redosled težine zadataka koji smo utvrdili ne bi trebalo da značajnije odstupa ni prilikom replikacije na uzorcima koji imaju drugačije karakteristike u pogledu SES-a i područja iz kojih deca dolaze. Isto verovatno važi i za presudnu značajnost kognitivnih procesa koji se razvijaju sa uzrastom, koji ostvaruje relaciju sa priraštajem u postignuću na različitim zadacima fonološke svesnosti.

S obzirom na činjenicu da je u ovom istraživanju zahvaćen nešto širi uzrasni interval dece u odnosu na istraživanje Subotića (2011), gde su deca bila mnogo bliža donjim granicama svojih uzrasnih kategorija, prilikom poređenja dobijenih rezultata sa navedenim istraživanjem postavlja se pitanje upotrebljivosti korišćenih normi. Naglašavamo da je reč o jedinom izvoru za komparaciju dobijenih rezultata koji nam je bio dostupan u ovom istraživanju.

Takođe, iz psihološko-pedagoške dokumentacije nismo uspeli da dobijemo precizne podatke o tome u kojoj meri je svako dete dodatno stimulisano u oblasti govorno-jezičkog razvoja u okviru porodičnog okruženja/vrtića/škole. U skladu sa navedenim činjenicama, u narednim istraživanjima pažnja će biti usmerena i na druge izvore podataka, kako bi se povećala mogućnost generalizacije dobijenih zaključaka. Na kraju, kako smo istraživanje sproveli na uzorku dece tipičnog razvoja, težinski raspored zadataka verovatno nije reprezentativan za decu sa govornim i jezičkim poremećajima (npr. moguće je pretpostaviti da bi se u takvim slučajevima veći broj zadataka mogao svrstati u kategoriju težih i da uzrasne razlike ne bi bile toliko očigledne ili presudne).

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DEVELOPMENT OF PHONOLOGICAL AWARENESS IN SIX TO EIGHT YEARS OLD CHILDREN

The goal of the research is to determine the course of development of elements of phonological awareness and interaction between these elements in children with typical development. The sample included 60 children of both sexes (51.6% boys and 48.4% girls), ages of six (33.3%), seven (38.3%), and eight (28.3%) years. Phonological awareness was measured using the revised FONT test, which contains eight types of phonological tasks. The results show generally high achievement of children in all types of phonological tasks (success rates between 73.3% and 90.8%). However, it was possible to differentiate relatively easy tasks (blending syllables, identifying rhyming, syllable segmentation, and identifying initial phonemes) from relatively difficult tasks (phonemic segmentation, phoneme substitution (initial phoneme), and elimination of the initial phoneme). The more difficult types of tasks were more intensely inter-correlated, while easier types of tasks were less correlated with other tasks (due to narrowed range of the values, i.e., very high average scores). The age differences were observed only on more difficult tasks, while on the easier ones, even six-year-olds achieved scores comparable to older children. Functional mastering of the hardest phonological skills is established at the age of about seven years. Gender, as well as gender and age interactions, did not prove to be important sources of difference in phonological achievement. We suggest that when examining phonological awareness in children with typical development (who show no indications of language difficulties), even at the age of six years, it is sufficient to use only four types of tasks that we identified as relatively more difficult.

Key words: age differences, phonological awareness, typically developing children

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UTICAJ AUTORSTVA NA PROCENU DUBOKOUMNOSTI PSEUDODUBOKOUMNIH VERBALIZAMA: KO IZGOVARA I KO VERUJE U BESMISLICE?[2]

Pseudodubokoumni verbalizmi (PDV) su gramatički i sintaksički ispravne rečenice sačinjene od nasumično odabranih reči, dizajnirane da impresioniraju čitaoca, a ne da ga informišu. Istraživanja pokazuju da su ispitanici skloni da PDV smatraju dubokoumnim, a pretpostavlja se da u osnovi toga leže dva mehanizma: pristrasno odgovaranje i smanjena sklonost prema kognitivnoj refleksiji. Ipak, na receptivnost na PDV može da utiče i izvor iskaza, tj. moguće je da ispitanici pretpostavljaju da iskazi prikazani u psihološkoj studiji imaju duboko i mudro značenje koje oni ne registruju, ali veruju da postoji. Cilj istraživanja bio trostruk: 1) ispitivanje fenomena PDV na srpskom jeziku, 2) replikacija nalaza o mehanizmima receptivnosti i senzitivnosti (sposobnost razlikovanja PDV i zaista dubokoumnih iskaza) na PDV i 3) provera uticaja izvora iskaza na te mere. Ispitanici su procenjivali dubokoumnost poslovica, zdravorazumskih istinitih zaključaka (ZIZ) i PDV (bez i sa pripisanim autorima različite pouzdanosti). Rešavali su 16 kategoričkih silogizama (KS) različitih po kongruentnosti između logičnosti i uverljivosti zaključka, numerički (CRT) i nenumerički test kognitivne refleksije (nCRT), i popunili su skalu verovanja o aktivnom mišljenju otvorenog uma (AOT). Ispitanici su PDV procenjivali kao više dubokoumne od ZIZ i manje dubokoumne od poslovica. Korelacije CRT, nCRT, AOT i CS sa receptivnošću i senzitivnošću na PDV su neznačajne. Kada se PDV-u pripiše izmišljeni autor ili autor upitne pouzdanosti procene dubokoumnosti

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[2] Deo rezultata je prikazan u formi poster prezentacije na XXV skupu Empirijska istraživanja u psihologiji, 2019. godine. Istraživanje je odobrila Komisija za etičnost istraživanja pri Odeljenju za psihologiju Filozofskog fakulteta Univerziteta u Beogradu. Istraživanje je sprovedeno u sklopu projekta koji finansira Ministarstvo prosvete, nauke i tehnološkog razvoja (ON 179033).

ostaju statistički iste, dok procene značajno rastu kada se PDV-u pripiše pouzdani autor. Nalazi o kognitivnoj refleksiji i pristrastnosti odgovaranja kao mehanizmima receptivnosti i senzitivnosti na PDV nisu replicirani. Rezultati pokazuju da izvor kao faktor konteksta utiče na receptivnost i senzitivnost na PDV.

Ključne reči: aktivno mišljenje otvorenog uma, efekat autorstva, kognitivna refleksija, pristrasnost uverenja, pseudodubokoumni verbalizmi

Uvod

„Kada vibrirate netrebanjem, Svemir osjeti vibraciju da to imate. I tada vam to stigne. Ovaj princip se odnosi i na sva ostala područja vašeg života. [...] Kada shvatite da je sve u vama, da je SVE U VAMA, tada će se desiti otpuštanje." (Bučević, 2015; str. 77).

Citat je odlomak iz knjige o samopomoći „*U Vorteksu ostvarenih želja"* Ane Bučević[3] (2015). Iako ovakvim sadržajima, osim empirijske osnove, nedostaje i samo značenje (Pennycook, Cheyne, Barr, Koehler, & Fugelsang, 2015), sedmo izdanje ove knjige, prvi put izdate 2015. godine, odštampano je već u 2016. godini. Usled proliferacije takvih sadržaja, kao i pristnosti i uticaja na javne rasprave, pa čak i na politiku, poraslo je i interesovanje filozofa komunikacije, a onda i psihologa, za fenomen koji se u literaturi na engleskom jeziku označava kao „*bullshit*" (Frankfurt, 2005). Imajući u vidu da se ovaj termin prvi put u ovom radu koristi u emprijskoj i teorijskoj psihologiji na srpskom jeziku, posvetićemo pažnju izboru prevodilačkog termina. Ipak, kako ovakve konceptualno-jezičke dileme iziskuju više i vremena i prostora, usmerićemo se samo na krajnji ishod izbora i obrazloženje. Prilikom izbora termina, kao i sa svakim konceptom koji emprija preuzima od filozofije, od presudne važnosti je bilo da u određenoj meri operacionalizujemo koncept, te da terminologija odslikava razliku između procesa, tj. produkcije navedenog sadržaja i samog produkta takvog procesa. Iz ovakvih stremljenja proizašao je i drugi kriterijum prilikom izbora termina, a to je postojanje svih relevatnih jezičkih formi. Konkretnije, iako je Fraknfurtova knjiga „*On bullshit*" (2005), koja ujedno predstavlja prvu filozofsku analizu ovog fenomena, prevedena na srpski jezik, sam prevod reči *bullshit,* premda atraktivan i kolokvijalno rasprostranjen, označava produkciju sadržaja. Osim toga, termin koji označava produkt je visoko polisemična reč koju svi znaju, ali koja je nedovoljno precizna da bude predmet psihološke emprije. Pored ovog, termini koji su bili predloženi su besmislice, gluposti, palamuđenje, lupetanje, trućanje, bulažnjenje. Za potrebe našeg istraživanja i rada, odlučile smo se da koristimo *verbalizam* (govorno izražavanje kome nedostaje smisao), *besmislica* ili *baljezgarija* za produkt, a baljezganje za produkciju. Naime, „verbalizacija" ne znači baljezaganje, a „besmislica" nema glagolskog parnjaka, i nije isključivo verbalne prirode. Ova tri termina tretiramo gotovo kao sinonime.

Verbalizam predstavlja iskaz koji je konstruisan sa ciljem da impresionira, uz manjak brige o istinitosti takvog iskaza (Frankfurt, 2005). Razmotrimo jedan primer: „smisao života [je] dati životu smisao" (Bučević, 2015, str. 37). Ovaj iskaz nije laž - laž nužno predstavlja neistinu, ali još važnije, da bi osoba izgovorila laž, ona mora da bude upoznata sa istinom, dok je u slučaju verbalizma istina u potpunosti

[3] Ana Bučević je kineziološkinja, motivaciona govornica i autorka većeg broja knjiga za samopomoć. Njen YT kanal „Safari duha" (https://www.youtube.com/user/safariduha1/featured) trenutno ima 208.975 pratilaca i preko 95 miliona pregleda, a primera radi, njena „metoda tapkanja" pogledana je preko 1.2 miliona puta.

irelevantna. Verbalizam je neizbežan kada god okolnosti nalažu da se govori bez znanja o čemu se priča (Frankfurt, 2005). Dve važne implikacije ovakve prirode verbalizama odnose se na činjenicu da oni ne mogu biti opovrgnuti (Hopkin & Rosamond, 2018) i da ljudi lakše tolerišu verbalizme nego laži, ujedno bivajući uvereni u svoju sposobnost da prepoznaju verbalizam (Frankfurt, 2005). Štaviše, ne samo da ljudi tolerišu verbalizme, već ih i smatraju dubokoumnim (Pennycook et al., 2015; Pennycook & Rand, 2017; Pfattheicher & Schindler, 2016; Sterling, Jost, & Pennycook, 2016).

Pseudodubokoumni verbalizmi

U psihološkoj literaturi pažnju istraživača zaokupila je posebna vrsta baljezgarija pod nazivom pseudodubokoumni verbalizmi (PDV). Ukoliko pretpostavimo da postoji kontinuum verbalizama, PDV predstavljaju ekstremnu poziciju, jer su konstruisani ne samo bez brige o istinitosti, već i bez brige o verovatnosti[4] takvog iskaza. To su gramatčki i sintaksički ispravne rečenice koje se sastoje od nasumično odabranih reči (Pennycook et al., 2015). Jedna od osnovnih karakteristika PDV je neodređenost takvih iskaza. Neodređenost i značenje po definiciji služe različitim svrhama, jer uključivanje neodređenosti zamagljuje značenje tj. smisao iskaza. Druga važna karakteristika PDV je nastojanje autora da takvi iskazi zvuče dubokoumno. Drugim rečima, PDV su besmisleni iskazi sastavljeni od modernih, apstraktnih reči, dizajnirani da impresioniraju, a ne da informišu (Pennycook et al., 2015).

Penikuk i saradnici (Pennycook et al., 2015) izveli su prvo istraživanje fenomena PDV i njegove veze sa ličnim dispozicijama poput religioznih verovanja, sklonosti da se veruje u alternativnu medicinu, teorije zavere i paranormalno, zatim sa merama verbalne i fluidne inteligencije, kognitivnih pristrasnosti i kognitivne refleksije. Cilj studije bio je da se ustanove mere i korelati *receptivnosti* i *senzitivnosti* na PDV. Receptivnost na PDV predstavlja sklonost da se PDV procenjuju kao dubokoumni, dok senzitivnost na PDV predstavlja sposobnost diskriminacije zaista dubokoumnih iskaza od besmislenih PDV. Receptivnost na PDV bila je negativno povezana sa kognitivnom refleksijom i verbalnom i fluidnom inteligencijom, a pozitivno sa kognitivnim pristrasnostima, religioznim verovanjima i verovanjima u paranormalno, teorije zavere i efikasnost alternativne medicine. Pokazalo se da postoje individualne razlike i u senzitivnosti na PDV, kao i da su osobe senzitivnije na PDV manje sklone paranormalnim verovanjima, a više analitičkom kognitivnom stilu zaključivanja. Zaključak autora bio je da procena dubokoumnosti PDV zavisi od individualnih razlika u kognitivnoj refleksiji - osoba koja zastane da analitički razmisli o značenju PDV trebalo bi da uoči nedostatak značenja takvog iskaza i da ga shodno tome odbaci kao potencijalno dubokoumni iskaz (Pennycook et al., 2015).

[4] Verovatnost (eng. verisimilitude) je filozofski koncept koji se tiče artikulacije toga šta je potrebno da jedna pogrešna teorija bude bliža istini od druge pogrešne teorije (Realism in American Literature 1860 - 1890).

Dalja istraživanja pokazala su da osobe koje procenjuju PDV kao dubokoumne imaju i niz drugih sklonosti: lažne vesti češće procenjuju kao istinite (Pennycook & Rand, 2017), imaju konzervativna politička opredeljenja (Pfattheicher & Schindler, 2016) i umereno podržavaju neoliberalnu ideologiju slobodnog tržišta (Sterling et al., 2016). Sklonost da se rečenice napravljene nasumičnim izborom reči procenjuju kao mudre i zasićene dubokim značenjem povezana je sa spektrom socijalnih i kognitivnih faktora, ali postavlja se pitanje koji mehanizmi stoje u osnovi te sklonosti.

Mehanizmi receptivnosti i izvor PDV

U istraživanjima koja su se bavila receptivnošću na PDV (Pennycook et al., 2015; Pennycook & Rand, 2017; Pfattheicher & Schindler, 2016; Sterling et al., 2016) dosledno se pokazuje da ispitanici takve iskaze ne smatraju nedubokoumnim. Predložena su dva neisključiva mehanizma zaslužna za receptivnost na verbalizme PDV (Pennycook et al., 2015). Prvi se odnosi na pristrasno odgovaranje (eng. response bias) i povezan je sa pretpostavkom da su neki ljudi jednostavno skloniji da različite stvari procenjuju kao istinite i smislene, dok drugi ljudi pristupaju istim stvarima primenjujući više kriterijume smislenosti i istinitosti. U kontekstu ovog istraživanja ova pristrasnost podrazumevala je sklonost ispitanika da čak i zdravorazumske istinite zaključke poput „zimski dani umeju da budu veoma hladni“ procenjuju u nekoj meri kao dubokoumne, kao i pozitivnu povezanost između procena dubokoumnosti ZIZ i PDV. Drugi mehanizam se odnosi na mogućnost da ljudi koji procenjuju PDV kao dubokoumne nisu u stanju da primete da je reč o verbalizmu, te da neodređenost iskaza mešaju sa dubokoumnošću. Ukratko, moguće je da osoba bude prosto nesvesna činjenice da stimulus zahteva dodatno razmatranje. Ovo je povezano sa neuspešnom detekcijom konflikta, koja predstavlja jedan od faktora koji kod (bar nekih) ljudi izaziva upuštanje u namerne analitičke procese rezonovanja. Pored ovih mehanizama, drugo moguće objašnjenje naglašava eksperimentalni kontekst, tj. implicitnu pretpostavku ispitanika da je istraživački materijal osmišljen sa ciljem da prenese neko značenje (Pennycook et al., 2015). Iako autori smatraju da njihova studija ima ekološku validnost, jer se ljudi u realnom životu sa PDV susreću na sličan način, bez znakova koji bi ukazali na to da je zapravo reč o verbalizmu, zaista je moguće da u realnom životu ispitanici pristupaju verbalizmima sa izvesnom dozom skepticizma, koji se u istraživačkoj situaciji ne javlja. U pitanju je potencijalni uticaj sredinskih faktora na percepciju stimulusa, poznat kao fenomen efekta konteksta, a jedan takav faktor bi mogao da bude i izvor, odnosno autor iskaza, koji može da se smatra pouzdanim ili nepouzdanim. Empirijska potpora za ovu pretpostavku dolazi iz različitih domena psihološkog istraživanja. Laici, ali i kritičari, naglašavaju izvore ukoliko treba da donesu estetski sud o umetničkom delu, ali ne i kada iznose lične estetske preferencije (Valsesia, Nunes, & Ordanini, 2014), dok procena kvaliteta poezije zavisi od reputacije i imena pripisanog autora (Bar-Hillel, Maharshak, Moshinsky,

& Nofech, 2012). Dalje, procene subjektivne prijatnosti prilikom konzumiranja istog vina zavise od visine cene koja mu je pripisana (Plassmann, O'Doherty, Shiv, & Rangel, 2008), a prilikom mirisanja izovalerične kiseline od toga da li je ispitanicima rečeno da je reč o telesnom mirisu ili mirisu čedar sira (De Araujo, Rolls, Velazco, Margot, & Cayeux, 2005). Procene kvaliteta muzičkih instrumenata zavise od informacije o tome ko je napravio violinu (Fritz, Curtin, Poitevineau, Morrel-Samuels, & Tao, 2012) itd. Dakle, postoji mogućnost da izvor, odnosno autor PDV kao faktor konteksta u kom se osoba susreće sa takvim iskazom, utiče na to da li će iskaz uopšte biti procenjen kao dubokouman i u kojoj meri.

Problem i cilj istraživanja

Imajući u vidu prevalentnost fenomena verbalizama, odnosno baljezganja, kako u javnoj komunikaciji, tako i u naučnoj literaturi, a primenjujući zaključke pobrojanih istraživanja na fenomen PDV, u ovom istraživanju proveravali smo da li izjava koja je „baljezgarija" ima veću težinu za ispitanika ukoliko je došla od pouzadnog autora. Preciznije, pitali smo se da li je pripisani autor PDV faktor konteksta, tj. da li utiče na procenu iskaza kao dubokoumnog i u kojoj meri. Cilj ovog istraživanja je prema tome trostruk i podrazumeva: 1) ispitivanje fenomena PDV na srpskom jeziku, u vezi sa čim je i prevod samog termina „bullshit", uz predlog rešenja, kao i prevod instrumenata i skala korišćenih u istraživanju, 2) delimična replikacija i proširenje osnovnih nalaza prve studije o PDV koju su izveli Penikuk i saradnici (Penycook et al., 2015) i 3) ispitivanje doprinosa faktora autorstva na promene u procenama dubokoumnosti PDV, uz pretpostavku da će viša pouzdanost autorstva povećati prihvatanje PDV kao zaista dubokoumnih.

Studija 1

Prva studija je replikativna, sa ciljem prevođenja skala, ispitivanja stavki i testiranja pouzdanosti tri skale, kao i provere osnovnog nalaza studije Penikuka i saradnika (Penycook et al., 2015) o negativnoj povezanosti kognitivne refleksije i receptivnosti na PDV.

Metod

Uzorak. Studija je sprovedena na studentima prve godine psihologije Filozofskog fakulteta Univerziteta u Beogradu (N = 39), za koje je učešće u eksperimentima predispitna obaveza. Verovatnoća dobijanja statistički značajnog efekta pripisanog autorstva putem analize varijanse za ponovljena merenja, na nivou $p < .01$, za veličinu efekta $d = 0.44$ koja je dobijena u istraživanju uticaja pripisanog autorstva na procene kvaliteta poezije (Bar-Hillel et al., 2012) iznosi 95% na uzorku od 38 ispitanika.

Instrumenti i mere. ***Skala receptivnosti na verbalizme (SRV, Bullshit Receptivity scale - BSR: Pennycook, et al., 2015).*** Skala je adaptirana i prevedena za potrebe istraživanja, a sastojala se od 12 PDV. Svi PDV iz originalne skale receptivnosti na verbalizme sačinjeni su pomoću generatora pseudodubokoumnih rečenica koji kreira besmislene iskaze sa ispravnom gramatičkom i sintaksičkom strukturom na osnovu postojeće baze reči (New Age Bullshit Generator, 2019). Sve iskaze ispitanici su procenjivali po dubokoumnosti na petostepenoj Likertovoj skali (Tabela 1).

Skala poslovica i Skala zdravorazumskih istinitih zaključaka. Osim SRV, ispitanicima su prikazane i skala od 12 poslovica, kao ekvivalent zaista dubokoumnim motivacionim citatima iz studije Penikuka i saradnika (2015), kao i skala od 12 zdravorazumskih istinitih zaključaka. Deset od 12 stavki skale ZIZ preuzeto je od Penikuka i saradnika (Penycook et al., 2015), a kako bi broj ovih iskaza bio jednak broju iskaza u SRV, kreirana su još dva zaključka. Procena dubokoumnosti obavljala se na petostepenoj Likertovoj skali (Prilozi A i B).

Test kognitivne refleksije (CRT, Cognitive Reflection Test, Frederick, 2005). Ovim testom se meri sposobnost ispitanika da inhibira intuitivni pogrešan odgovor i da se upusti u analitičko rezonovanje. Zadaci okidaju tri vrste odgovora: tačne, netipične pogrešne i tipične pogrešne (tzv. heurističke). U našem istraživanju koristili smo verziju testa od osam zadataka (Damnjanović, Novković, Pavlović, Ilić, & Pantelić, 2019).

Procedura. Eksperiment je kreiran u programu OpenSesame (Mathôt, Schreij, & Theeuwes, 2012) i izveden je u računarskoj učionici na Filozofskom fakultetu u Beogradu. Nakon potpisivanja informisane saglasnosti, ispitanici su dobili uputstvo u verbalnoj i pisanoj formi, a potom su svi istovremeno pristupili radu. Ispitanicima je prvo prikazano ukupno 36 rečenica: slučajnim redosledom iz SRV, skala poslovica i skala ZIZ. Zadatak ispitanika je bio da procene dubokoumnost svake rečenice, a zatim su rešavali CRT. Mesec dana kasnije im je dato detaljno usmeno i pismeno objašnjenje procedure i cilja istraživanja.

Rezultati

Pouzdanost, izražena Kronbahovom alfom, u slučaju sve tri skale je zadovoljvajuća: pouzdanost SRV iznosila je .83, dok su vrednosti alfe za skalu poslovica i skalu ZIZ .82 i .79. Deskriptivna statistika za svaku stavku SRV skale prikazana je u Tabeli 1.

Tabela 1
Deskriptivna statistika za Skalu receptivnosti na verbalizme

Pseudodubokoumni verbalizam	*AS*	*SD*	*Sk*	*Ku*	*ITC*
Budućnost će biti astralno razotkrivanje nerazdeljivosti.	1.82	1.14	1.26	0.52	.55**
Budućnost objašnjava iracionalne činjenice.	2.05	1.12	0.71	-0.38	.36*
Celovitost umiruje beskonačne pojave.	2.46	1.21	0.32	-0.83	.59**
Danas nam nauka govori da je suština prirode radost.	2.28	1.19	0.60	-0.46	.35*
Dobro zdravlje prenosi realnost u suptilnu kreativnost.	2.03	0.90	0.17	-1.28	.37*
Mašta se nalazi u eksponencijalnim prostorno-vremenskim događajima.	2.13	1.10	0.84	0.42	.52**
Nalazimo se u sred procesa samosvesnog sazrevanja bića koje će nas poravnati sa samom suštinom.	2.74	1.11	-0.05	-1.03	.54**
Nalazimo se u sred visoko-frekventnog sazrevanja međupovezanosti koje će nam dati pristup samoj kvantnoj plazmi.	1.79	1.30	1.53	1.06	.64**
Perceptivna realnost prevazlazi suptilnu istinu.	2.51	1.02	0.35	-0.41	.65**
Skriveno značenje transformiše neponovljivu apstraktnu lepotu.	2.87	1.17	0.05	-0.50	.50**
Svesnost predstavlja rast koherentnosti i naš rast.	2.69	1.21	0.26	-0.88	.37*
Svesnost se sastoji od frekvencija kvantne energije. „Kvant" predstavlja otkrivanje neograničenog.	2.18	1.25	0.65	-0.65	.56**
Proseci za skalu	2.30	1.14	0.56	-0.37	α = .83

Napomena. *AS* - aritmetička sredina; *SD* - standardna devijacija; Sk – mera zakošenosti; Ku – mera spljoštenosti; *ITC* - Item-total korelacija.
* $p < .05$. ** $p < .01$.

Ispitanici su PDV procenjivali u proseku kao malo do srednje dubokoumne (*M* = 2.30, *SD* = 0.69). Preciznije, 30.8% ispitanika je dubokoumnost PDV u proseku procenilo kao malo dubokoumne, 50.3% kao srednje dubokoumne, a preostalih

17.9% ispitanika je dalo prosečnu procenu jednaku ili veću od 3 (4 – definitivno dubokoumno). Nijedan ispitanik nije procenio svih 12 PDV kao nedubokoumne.

U poređenju sa PDV, ZIZ su procenjeni kao manje dubokoumni (M = 1.44, SD = 0.54), a poslovice kao više dubokoumne (M = 3.19, SD = 0.62). ANOVA za ponovljena merenja pokazala je da je razlika između ovih procena statistički značajna, $F(2, 76) = 89.01$, $p < .001$, $^2 = .70$. Post hoc testovi sa Bonferroni korekcijom pokazali su da su razlike u procenama dubokoumnosti između sva tri nivoa ovog faktora statistički značajne. Prosečna razlika između procena dubokoumnosti PDV i ZIZ iznosila je .86 ($p < .001$), a između PDV i poslovica -.89 ($p < .001$). Broj tačnih odgovora na CRT se kretao u rasponu od 0 do 7. Nijedan ispitanik nije rešio tačno sve zadatke (Tabela 2).

Tabela 2
Raspodela broja tačno rešenih CRT zadataka

Broj tačno rešenih zadataka	% ispitanika	Kumulativni % ispitanika
0	7.7	7.7
1	15.4	23.1
2	23.1	46.2
3	10.3	56.4
4	17.9	74.4
5	15.4	89.7
6	5.1	94.4
7	5.1	100
8	0.0	100

Pirsonova korelacija između broja tačnih odgovora na CRT i receptivnosti na PDV nije statistički značajna (p = .35), kao ni korelacija između broja tačnih odgovora na CRT i mere senzitivnosti na PDV (razlika između prosečnih procena dubokoumnosti PDV i poslovica) (p = .13).

Diskusija

Rezultati pokazuju da SRV, kao i skale poslovica i ZIZ imaju zadovoljavajuće pouzdanosti. Ispitanici su, u skladu sa očekivanjima, zaista procenjivali poslovice kao najdubokoumnije, PDV kao manje dubokoumne, a ZIZ kao najmanje dubokoumne. Osim toga, ispitanici su PDV u proseku procenjivali kao nisko do umereno dubokoumne, što je takođe u skladu sa nalazima replicirane studije (Pennycook et al., 2015), koji ukazuju da ispitanici u velikoj meri nisu u stanju da primete da je

reč o verbalizmima – dve trećine uzorka procenilo je PDV u proseku kao više nego „malo dubokoumne".

Nalaz da su kognitivno refleksivnije osobe manje receptivne na PDV, i da individualne razlike u receptivnosti na PDV potiču od individualnih razlika u kognitivnoj refleksivnosti, nije repliciran. Naši rezultati sugerišu da su i ispitanici sa manjom i sa većom sposobnošću kognitivne refleksije skloni da PDV procenjuju kao dubokoumne. Osim toga, nije registrovana ni veza između kognitivne refleksivnosti i senzitivnosti na PDV. Ova dva rezultata mogu da se tumače u svetlu činjenice da CRT, prema nekim autorima, ne meri samo sposobnost kognitivne refleksije, već i sposobnost računanja (Böckenholt, 2012; Campitelli & Gerrans, 2014; Del Missier, Mäntylä, & De Bruin, 2012; Sinayev & Peters, 2015; Thomson & Oppenheimer, 2016; Welsh, Burns, & Delfabbro, 2013). Moguće je da negativna veza između receptivnosti na PDV i sposobnosti kognitivne refleksije postoji, ali je konfundirana individualnim razlikama u sposobnosti računanja. Osim toga, neki ispitanici mogli su se već susresti sa zadacima koji čine CRT na domaćim sajtovima (npr. „Najkraći test inteligencije", 2017) ili prilikom učešća u drugim istraživanjima, jer je CRT jedan od nezaobilaznih testova u ovoj oblasti (Thomson & Oppenheimer, 2016). Zbog navedenog su u glavnom eksperimentu upotrebljene druge direktne i indirektne mere kognitivne refleksije.

Studija 2

Metod

Uzorak. Uzorak (N = 84) su činili studenti druge godine psihologije Filozofskog fakulteta Univerziteta u Beogradu, koji su dobili poene za izvršenje ove predispitne obaveze.

Instrumenti i mere. Za merenje receptivnosti i senzitivnosti na PDV upotrebljene su iste skale kao u studiji 1, pri čemu su stavke iz SRV skale prikazane samostalno i sa pripisanim autorima različitog stepena pouzdanosti.

Autorstvo. Iskazi su kategorisani u grupe od po četiri iskaza kojima su potom pripisani autori različitog stepena pouzdanosti: pouzdani (filozofi i fizičari: Niče, Platon, Hoking, Ajnštajn), upitno pouzdani (holivudski glumci: Džoni Dep, Brus Vilis, Mel Gibson, Bred Pit) i slučajno generisana imena – izmišljeni autori. Kako bi svakom iskazu bili pripisani autori sva tri nivoa pouzdanosti, napravljene su tri kontrabalansirane verzije skale. Svi autori su bili ujednačeni po polu, a odabrane su poznate osobe kako bi se mogućnost da ispitanici nisu čuli za nekog pripisanih autora svela na minimum (Prilog C).

Uverljivost eksperimentalne manipulacije. Kako bi manipulacija bila što uverljivija, ispitanicima su izvori prikazani u zagradi, u formi reference, a uz autora su navedeni godina, mesto (ukoliko je reč o javnom obraćanju) i vrsta izvora iz kog je navodno preuzet citirani iskaz - npr. „(Bruce Willis, The fifth element

(press conference), Canes, 2006)“ ili „(Albert Einstein, Letter to Phyllis Wright, 1936)“. Svi upotrebljeni izvori zaista postoje - Albert Ajnštajn zaista jeste napisao pismo Filis Rajt 1936. godine. Izmišljena imena su kreirana pomoću generatora (Random name generator: ˽www.behindthename.com/random/) i predstavljaju kontrolni uslov, a zadati kriterijumi radi ujednačavanja sa imenima autora iz prve dve kategorije bili su američko, englesko, škotsko, velško, nemačko ili grčko muško ime i prezime (bez srednjeg imena). Uniseks imena (npr. Casey), kao i imena i prezimena koja predstavljaju postojeću reč (npr. Cash) su isključena. Kako bi se u potpunosti eliminisala (mada minimalna) mogućnost da ispitanici poznaju osobu sa ovim imenom, sva imena i prezimena koja su se pokazala kao postojeća pretragom na Google pretraživaču bila su izuzeta. Imena autora iz ove kategorije navođena su u zagradi, ali bez godine, mesta i vrste izvora - npr. „Perceptivna realnost prevazilazi suptilnu istinu. (Montgomery Brigham)”. Ostala imena su Daniel Blair, Mikkjal Nikephoros i Millard Royden.

Nenumerički test kognitivne refleksije (alternate Cognitive Reflection Test – nCRT; Thomson, & Oppenheimer, 2016). Ispitanicima je zadata nenumerička verzija testa kognitivne refleksije koja služi merenju iste sposobnosti prevazilaženja prvog intuitivnog i pogrešnog odgovora, kako bi se upustila u dublju refleksiju i došla do tačnog odgovora koji u ovoj verziji ne zahteva računanje. U poređenju sa numeričkim verzijama, nCRT ne zahteva veštine računanja i upotrebljen je u mnogo manjem broju istraživanja[5]. Sastoji se od četiri pitanja koja facilitiraju heurističke i tačne odgovore.

Kategorički silogizmi. Prikazano je 16 silogizama konstruisanih za potrebe ovog istraživanja, a koji su se razlikovali po uverljivosti (uverljivi i neuverljivi) i po tome da li zaključak logički sledi iz premisa (logički sledi, ne sledi logički). Ukrštanjem su napravljene četiri vrste silogizama, podeljenih u dve kategorije: kongruentni - uverljivi logični, neuverljivi nelogični; i nekongruentni - uverljivi nelogični, neuverljivi logični. Procedura ispitivanja podrazumeva odgovaranje na pitanje da li prikazani zaključak sledi iz premisa, a ovakvim zadacima se meri pristrasnost uverenja (eng. belief bias; Evans, Barston, & Pollard, 1983) i odnosi se na tendenciju ispitanika da o logičkoj utemeljenosti zaključka sude na osnovu prethodnog znanja, a ne na osnovu logičkih pravila. Prema autorima nCRT, zadaci koji se koriste kako bi se registrovala pristrasnost uverenja predstavljaju dobar izvor zadataka koji se mogu uključiti u testove kognitivne refleksije (Thomson & Oppenheimer, 2016). Primer jednog upotrebljenog kategoričkog silogizma nalazi se u Prilogu D.

Skala verovanja o aktivnom mišljenju otvorenog uma (eng. Actively Open-minded Thinking Belifes Scale – AOT; Baron, 1993). Ova skala je namenjena merenju stavova o stilu mišljenja koje podrazumeva da se postojeća uverenja razmatraju u svetlu novih dokaza, da se provede značajno vreme u pokušajima da

[5] Prema Google Scholar pretraživaču nenumerička verzija CRT (Thomson & Oppenheimer, 2016) citirana je 75 puta, dok je samo Frederikov članak (Frederick, 2005) u kom je predstavljena originalna kratka verzija testa citiran 3068 puta.

se reši problem pre odustajanja, kao i da se razmotre mišljenja drugih prilikom formiranja sopstvenog. Osobe koje su sklonije analitičkom stilu mišljenja manje su sklone pristrasnosti uverenja (Macpherson & Stanovich, 2007; Sá, West, & Stanovich, 1999; Stanovich & West, 1998).

Procedura. Eksperiment je kreiran u programu OpenSesame (Mathôt et al., 2012). Održan je u računarskoj učionici na Filozofskom fakultetu u Beogradu, a obuhvatio je dve eksperimentalne seanse. Pre početka, ispitanici su potpisali informisanu saglasnost i pročitano im je uputstvo koje su tokom rada imali priliku i sami da pročitaju. U prvoj seansi su nasumičnim redosledom prikazivani silogizmi, a tokom druge, takođe nasumičnim redosledom, 36 iskaza, nenumerički CRT i AOT skala. Zadatak ispitanika je bio da procene prikazane iskaze (SRV bez autora, poslovice, zdravorazumski istiniti zaključci) po dubokoumnosti. Nakon nCRT, prikazana je SRV, ali ovaj put sa pripisanim autorima iskaza, a na kraju AOT skala. Dve nedelje kasnije ispitanicima je dato detaljno usmeno i pismeno objašnjenje procedure i cilja istraživanja.

Nacrt i varijable. Istraživanje je mešovitog dizajna sa ponovljenim merenjima. Korelacioni deo istraživanja obuhvatao je varijable: broj tačnih odgovora na nCRT, ukupni skor na AOT, broj tačno rešenih kognruentnih i nekongruentnih silogizama, prosečnu procenu dubokoumnosti na SRV – receptivnost na PDV, i senzitivnost na PDV koja je izračunata kao razlika između prosečnih procena dubokoumnosti poslovica i pseudodubokoumnih iskaza. Eksperimentalni deo istraživanja obuhvatao je tri faktora: tip iskaza, prispisanost i autorstvo (tretman). Faktor tip iskaza ima tri nivoa: PDV (obuhvaćeni SRV skalom), poslovice i zdravorazumski istiniti zaključci. Zavisne varijable obuhvataju prosečne procene dubokoumnosti različitih tipova iskaza (PDV, poslovica i zdravorazumski istiniti zaključak). Drugi faktor je pripisanost i ima dva nivoa: sa i bez autora (pre-test i post-test), dok tretman podrazumeva prikazivanje autora različitog nivoa pouzdanosti uz PDV (SRV skala) i ima tri nivoa: pouzdani, autor upitne pouzdanosti i izmišljeni. Korespondirajuće zavisne varijable obuhvataju prosečne procene dubokoumnosti iskaza *sa* pripisanim autorima različitog stepena pouzdanosti (post-test) i prosečne procene odgovarajućih (istih) iskaza bez pripisanih autora (pre-test).

Rezultati

Ispitanici su u proseku PDV (M = 2.40; SD = 0.71) procenjivali kao manje dubokoumne u odnosu na poslovice (M = 3.40; SD = 0.77), i kao više dubokoumne u odnosu na zdravorazumske istinite iskaze (M = 1.31; SD = 0.43). Analiza varijanse za ponovljena merenja pokazala je da je razlika u proceni dubokoumnosti različitih tipova iskaza statistički značajna, $F(1.63, 135.21) = 232.87$, $p < .001$, $\eta^2 = .74$[6]. Post hoc testovi sa Bonferoni korekcijom pokazali su da su razlike u procenama dubokoumnosti između sva tri nivoa ovog faktora (tip iskaza) statistički značajne.

[6] Mošlijev test pokazao je da pretpostavka o sferičnosti nije ispunjena ($\chi 2(2) = 21.19$, $p < .001$) te su *df* korigovani Grinhaus-Gejzerovom procenom sferičnosti ($\varepsilon = .82$).

Prosečna razlika između procena dubokoumnosti PDV i zdravorazumskih istinitih zaključaka iznosila je 1.09 (p <.001), dok je prosečna razlika između procena dubokoumnosti poslovica i PDV iznosila 1.00 (p < .001). Korelacija između procena dubokoumnosti PDV i ZIZ, kao indikator pristrasnosti odgovaranja, nije bila statistički značajna i iznosila je .14 (p = .22).

Prosečna procena dubokoumnosti PDV predstavlja meru receptivnosti na PDV. Senzitivnost na PDV, koja predstavlja meru sposobnosti da se detektuje da je PDV zapravo verbalizam, izračunata je oduzimanjem prosečnih procena dubokoumnosti PDV od prosečnih procena dubokoumnosti poslovica. Pirsonove korelacije ove dve mere sa merama kognitivne refleksivnosti, sklonosti prema pristrasnosti uverenja i prema aktivnom mišljenju otvorenog uma prikazane su u Tabeli 3.

Tabela 3

Pirsonove korelacije između senzitivnosti i receptivnosti na PDV i direktnih i indirektnih mera sklonosti i sposobnosti kognitivne refleksije

	Receptivnost na PDV	nCRT	AOT	Nekongruentni KS	Kongruentni KS
nCRT	-.05				
AOT	-.09	.05			
Nekongruentni KS	-.03	.21	.43**		
Kongruentni KS	.07	.15	.09	.29**	
Senzitivnost na PDV	-.70**	-.05	.02	-.07	-.09

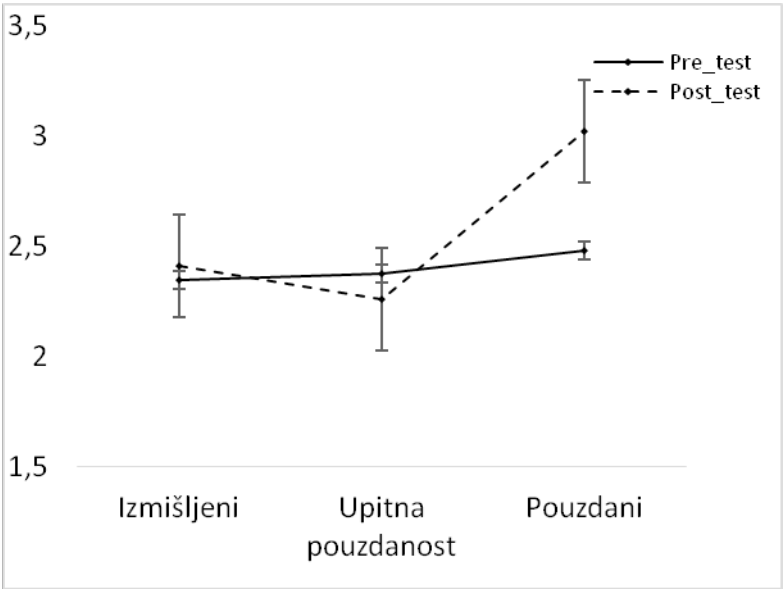
Napomene. PDV - pseudodubokoumni verbalizam; nCRT - nenumerički test kognitivne refleksije; AOT - Skala stavova o aktivnom mišljenju otvorenog uma; KS - kategorički silogizmi.

** p < .01.

U Tabeli 2 uočava se da senzitivnost i receptivnost na PDV nemaju značajne korelacije ni sa jednim od upotrebljenih testova. Značajne korelacije registrovane su između broja tačnih odgovora na kongruentnim i nekongruentnim kategoričkim silogizmima, između skora na AOT i broja tačno rešenih nekongruentnih silogizama, i između receptivnosti i senzitivnosti na PDV. Korelacija između broja tačnih odgovora na nCRT i na nekongruentnim silogizmima pokazuje graničnu statističku značajnost (p = .05). Sve ostale korelacije bliske su nuli.

Kako bi se procenio uticaj autorstva na procene dubokoumnosti upotrebljene su prosečne procene dubokoumnosti PDV bez i sa pripisanim autorima (istih) iskaza. ANOVA za ponovljena merenja pokazala je da postoji statistički značajna interakcija između pripisanosti autorstva (bez i sa) i autorstva (pouzdan, upitno pouzdan, izmišljeni autor): $F(2, 166) = 28.28$, $p < .001$, $\eta^2 = .25$. Glavni efekat pripisanosti autora je statistički značajan, $F(1, 83) = 11.04$, $p = .001$, $\eta^2 = .12$, a

isto važi i za glavni efekat tretmana, $F(2, 166) = 22.43$, $p < .001$, $\eta^2 = .21$. Procene dubokoumnosti PDV se menjaju ukoliko se iskazima pripišu autori, a stepen i smer promene zavise od pouzdanosti autora, što se vidi na Slici 1.



Slika 1. Interakcija faktora pripisanost autora i faktora pozdanost autora. Prikazane su prosečne procene dubokoumnosti PDV i standardne greške procena, s tim da je prikazani raspon mogućih vrednosti prosečnih procena (na Y osi) skraćen kako bi razlike između prosečnih procena na pre- i post-testu bile vidljivije.

Kada je iskazima pripisan autor upitne pouzdanosti, prosečne procene dubokoumosti opadaju, a kada je iskazima pripisan pouzdani ili izmišljeni autor, procene dubokoumnosti, mada u različitom stepenu, rastu u odnosu na prosečne procene dubokoumnosti istih iskaza, ali bez pripisanih autora. Post hoc poređenja pre- i post-test procena dubokoumnosti PDV zavisno od stepena pouzdanosti autora, uz Bonferoni korekciju, pokazala su da ukoliko se iskazu pripiše izmišljeni autor, procene dubokoumnosti ostaju nepromenjene – registruje se statistički neznačajni prosečni porast od niskih .06 ($p = .38$), kao i kada se pripiše nepouzdani autor ($p = .10$). Sa druge strane, procene statistički značajno rastu ukoliko se iskazu pripiše pouzdani autor i to u proseku za .54, $F(1, 83) = 52.64$, $p < .001$, $\eta^2 = .39$.

Diskusija

Ko sluša: kognitivna refleksija i PDV

Cilj ovog delimično replikativnog istraživanja je bio dvojak: detaljniji opis mehanizama sklonosti da se verbalizmi procenjuju kao dubokoumni, te provera nalaza Penikuka i saradnika (Penycook et al., 2015). Naši nalazi ne idu u prilog zaključku da individualne razlike u kognitivnoj refleksivnosti dovode do individualnih razlika u sklonosti da se PDV procenjuju kao dubokoumi. Pretpostavka da osobe koje imaju izraženiju sposobnost kognitivne refleksije i da stoga PDV ne smatraju dubokoumnim, nije potvrđena. Potencijalno objašnjenje ovakvog nalaza moglo bi da se zasniva na činjenici da je test kognitivne refleksije već poznat nekim ispitanicima, kao i da je u CRT-u sposobnost kognitivne refleksije konfundirana sa sposobnošću računanja, te smo iz tog razloga uključili i druge direktne i indirektne mere kognitivne refleksije. Ipak, nalazi dobijeni i na osnovu ovih mera dodatno potvrđuju zaključak da receptivnost, ali i senzitivnost na PDV, ne zavise od kognitivne refleksivnosti. Mehanizam zaslužan za procenjivanje PDV kao dubokoumnih verovatno ne podrazumeva nedostatak uviđanja da prikazani iskaz zahteva dodatno razmatranje. Uzimajući u obzir da su u proseku ispitanici čak i zdravorazumske istinite zaključke procenjivali kao dubokoumne u nekom stepenu, moguće je da u osnovi procena PDV kao dubokoumnih leži opšta tendencija da se iskazi, ma kakvi, procenjuju kao dubokoumni u (bar) nekoj meri. Ipak, povezanost između procena dubokoumnosti PDV i zdravorazumskih istinitih zaključaka nije bila statistički značajna. Osim toga, činjenica da se PDV dosledno procenjuju kao značajno dubokoumniji, tj. srednje do definitivno dubokoumni kada im se pripiše pouzdani autor, posredno ukazuje na alternativno objašnjenje ove sklonosti – kada je u pitanju mudrost, važnije je ko je autor iskaza, nego sadržaj iskaza. Shodno tome, nalaz da se i objektivno nedubokoumni zdravorazumski istiniti zaključci procenjuju kao dubokoumni, koji se uzima kao jedan od pokazatelja pristrasnosti odgovaranja kao drugog mehanizma odgovornog za procene PDV kao dubokoumnih, možda predstavlja metodološki artefakt, tj. implicitno očekivanje ispitanika da eksperimentalni materijal mora imati neko značenje (Pennycook et al., 2015).

Ko priča: autor i PDV

Naši nalazi ukazuju na to da kontekst PDV utiče na to koliko se takvi iskazi smatraju mudrim i značajnim. Činjenica da do promene u proceni dubokoumnosti dolazi u okviru iste eksperimentalne seanse, dodatno podržava ovaj nalaz, a pripisivanje autora različitog stepena pouzdanosti dovodi do različitih promena u proceni dubokoumnosti PDV. Pripisivanje izmišljenog i autora upitne pouzdanosti ne utiče na procene ispitanika, ali kada se besmislenom iskazu pripiše ime filozofa ili fizičara, procene dubokoumnosti značajno rastu. Implikacije ovakvog

nalaza su teorijsko-psihološke i praktične. Prvo, jedno od glavnih pitanja u oblasti viših kognitivnih procesa je šta ljude nagoni da detektuju konflikt, što u ovom slučaju podrazumeva *uočavanje* da je prikazani PDV besmislen, te da se upuste u namerno analitičko rezonovanje (Damnjanović et al., 2019; Pennycook, 2018). Naime, u skladu sa teorijama dualnih procesa, nije dovoljan samo kapacitet (npr. inteligencija) već je neophodna i volja za upuštanje u namerno analitičko rezonovanje (Stanovich, 2011; Stanovich & West, 2000). U kontekstu receptivnosti na PDV, jedan od potencijalnih „okidača" volje da se pristupi kritičkom razmatranju iskaza mogao bi da bude upravo izvor PDV. Na primer, ukoliko PDV dolazi od osobe u koju (iz bilo kog razloga) nemamo poverenja, bićemo skloniji da iskaze te osobe kritički preispitamo, ili odbacimo. Dalje, moguće je da znanje o izvoru PDV dovede i do suprotnog efekta ukoliko autora PDV smatramo posebno pouzdanim, a upravo to naši rezultati sugerišu. Ovo nas dovodi do druge implikacije koja se odnosi na potencijalne društvene posledice toga da se nešto besmisleno smatra mudrim samo zato što dolazi od izvora koji se smatra pouzdanim. Na primer, u jednom komentaru aktuelnog političkog diskursa u Velikoj Britaniji, ali i šire, autori konstatuju da su verbalizmi postali dominantni modalitet političkog izražavanja i definišuća karakteristika demokratije (Hopkin & Rosamond, 2018). Budući da ne korespondiraju sa činjenicama ili istinom, pa samim tim ne mogu biti opvrgnuti i upravo je ovo karakteristika koja ih čini opasnijim i društveno korozivnijim od laži (Frankfurt, 2005; Hopkin & Rosamond, 2018). Međutim, da li će verbalizmi biti prihvaćeni ili ne zavisi od publike i od mehanizama putem kojih neopovrgljive fraze postaju temelj politike i rasprava u javnosti. U našem istraživanju pokazali smo da procene mudrosti i važnosti takvih iskaza zavise od izvora. Kao pouzdani izvori ovde su odabrani poznati filozofi i fizičari o čijim misaonim podvizima učimo od osnovne škole, ali ti izvori pripisani su potpuno besmislenim rečenicama koje se zbog toga procenjuju kao definitivno mudre i od širokog značaja. Posledice procenjivanja sadržaja od širokog društvenog značaja kao mudrih samo na osnovu izvora su jasne i dalekosežne, kao u primeru rasprave o predlogu Zakona o porodici kojim se zabranjuje fizičko kažnjavanje dece. Ovaj predlog veoma je uzburkao javnost, a u medijima, pisanim izvorima i u javnosti protivljenje ovom predlogu potkrepljivano je raznim verbalizmima koji su epitete mudrosti, istinitosti i značajnosti dugovali reputaciji autora koji su ih iznosili. Nalazi ovog istraživanja osvetljavaju deo mehanizma koji je zaslužan za procenu besmislenih iskaza kao dubokoumnih.

Ograničenja i preporuke

Osnovno ograničenje nalaza leži u uzorku koji su činili studenti psihologije, te dobijene rezultate treba replicirati na reprezentativnijem uzorku u populaciji. Sama manipulacija pouzdanosti izvora bila je delimično uspešna, te je jedan pravac rešavanja izvođenje normativne studije pouzdanosti autora. Iz tog razloga, u ovom istraživanju nismo tvrdili da holivudski glumci predstavljaju nepouzdane izvore,

već smo ih označili izvorima upitne pouzdanosti. Dalja razrada mehanizama PDV treba da obuhvati i druge kategorije iskaza, koji se međusobno razlikuju po stepenu smislenosti i impresivnosti. Konačno, u našem istraživanju, svi autori bili su muškog pola, prosto zato što je bilo lakše odabrati četiri univerzalno poznata filozofa i fizičara usled značajno manje reprezentovanosti žena u redovima vrlo poznatih fizičara i filozofa. Kako postoje nalazi o razlikama u percepciji stepena kvaliteta naučnih radova muškaraca i žena (Goldberg, 1968; Paludi & Bauer, 1983) i stepena u kom muškarci i žene poseduju kvalitete neophodne da bi bili dobri naučnici i naučnice (Carli, Alawa, Lee, Zhao, & Kim, 2016), opravdano je pretpostaviti i ispitati potencijalni moderatorski uticaj varijable pol autora na odnos između pouzdanosti izvora i promena u procenama dubokoumnosti.

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Prilog A

Lista stavki obuhvaćenih skalom poslovica

1. Kad se slože i slabi su jaki.
2. Bolje je u kolibi pevati, nego u dvoru plakati.
3. Bolje vrabac u ruci, nego golub na grani.
4. Vuk dlaku menja ali ćud nikada.
5. Jezik nema kosti, ali ih lomi.
6. Gvožđe se kuje dok je vruće.
7. Ne postoji drvo bez grane, niti čovek bez mane.
8. Bolje suv hleb sa poštenjem, nego kolač sa nepoštenjem.
9. Da je steći kao što je reći, svi bi bogati bili.
10. Ko drugome jamu kopa, sam u nju upada.
11. Pametni ljudi uče na tudjim greškama, a budale na sopstvenim.
12. Na muci se poznaju junaci.

Prilog B

Lista stavki obuhvaćenih skalom zdravorazumskih istinitih zaključaka

1. Zimski dani mogu da budu veoma hladni.
2. Balansirana ishrana je važna za održavanje dobrog zdravlja.
3. Lenji ljudi uglavnom ne uspeju u životu.
4. Deca ponekad dosta liče na svoje roditelje.
5. Većina ljudi uživa u nekoj vrsti muzike.
6. Različite kulture se obično dosta razlikuju jedna od druge.
7. Ljudi često imaju bizarne snove.
8. Neki ljudi nemaju ukusa za oblačenje.
9. Neki stari ljudi ne čuju dobro.
10. Novorođenčad zahtevaju stalnu pažnju.
11. Različite stvari često imaju različite mirise.
12. Više stope nezaposlenosti često prate ekonomski pad.

Prilog C

Primer skale receptivnosti na pseudodubokoumne verbalizme sa pripisanim autorima različitog stepena pouzdanosti

1. Skriveno značenje transformiše neponovljivu apstraktnu lepotu. (Fridrih Niče, pismo E. Rodeu, 1870)
2. Dobro zdravlje prenosi realnost u suptilnu kreativnost. (Platon, Theaetetus, oko 369. godine p.n.e.)
3. Celovitost umiruje beskonačne pojave (Stephen Hawking, Brief answers to the big questions, 2018.)
4. Budućnost objašnjava iracionalne činjenice. (Albert Einstein, Letter to Phyllis Wright, 1936)
5. Mašta se nalazi u eksponencijalnim prostorno-vremenskim događajima. (Johnny Depp, Rolling Stone, 2018)
6. Nalazimo se u sred procesa samosvesnog cvetanja bića koje će nas poravnati sa samom suštinom. (Bruce Willis, The fifth element (press conference), Canes, 2006)
7. Svesnost se sastoji od frekvencija kvantne energije. "Kvant" predstavlja otkrivanje neograničenog. (Brad Pitt, GQ Style Interview, 2017)
8. Svesnost predstavlja rast koherentnosti i naš rast. (Mel Gibson, Conspiracy theory (Press conference), 1997)
9. Nalazimo se u sred visoko-frekventnog cvetanja medjupovezanosti koje će nam dati pristup samoj kvantnoj plazmi. (Daniel Blair)
10. Danas nam nauka govori da je suština prirode radost. (Mikkjal Nikephoros)
11. Perceptivna realnost prevazlazi suptilnu istinu. (Montgomery Brigham)
12. Budućnost će biti astralno razotkrivanje nerazdeljivosti. (Millard Royden)

Prilog D

Primer kategoričkog silogizma

Premisa 1: Sve afričke države su siromašne.

Premisa 2: Švajcarska nije afrička država.

Zaključak: Švajcarska nije siromašna.

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THE INFLUENCE OF AUTHORSHIP ON RECEPTIVITY TO PSEUDO-PROFOUND BS: WHO TALKS AND WHO BELIEVES IN NONSENSE?

Pseudoprofound bullshit (PPB) pertains to gramatically and syntactically correct sentences comprised of randomly selected words, designed to impress and not to inform. Research shows that participants deem PPB as profound, and it is assumed that there are two underlying mechanisms: response bias and lesser pronneness to cognitive reflection. However, receptivity to PPB can be influenced by the source of the statement, that is – participants might assume that statements presented in a psychological study have profound meaning which they don't register but presume present. The aim of this study was triple: 1) to investigate the PPB phenomenon in serbian language, 2) replicate findings regarding mechanisms underlying receptivity and sensitivity to (ability to differentiate between PPB and truly profound statements) PPB, and to 3) test the influence which source of the statement has on those measures. Participants rated profundity of proverbs, mundane statements and PPB without and with assigned authors of different levels of trustworthiness. They solved 16 categorical syllogisms (CS) which differed by congruency between the conclusion plausibility and whether it was supported by premises, numerical (CRT) and non-numerical Cognitive Reflection Test (nCRT), and they completed Actively Open-minded Thinking Beliefs scale (AOT). Participants rated PPB as more profound than mundane statements, and less profound than proverbs. Correlations between CRT, nCRT, AOT, CS and receptivity and sensitivity to PPB were non-significant. When made up and authors of questionable trustworthiness are assigned to PPB, profundity ratings remain statistically unchanged, while they significantly rise when a trustworthy author is assigned. Findings regarding response bias and cognitive reflection as underlying mechanisms of receptivity and sensitivity to PPB were not replicated. Results show that the source as a contextual factor influences receptivity and sensitivity to PPB.

Key words: actively open-minded thinking, authorship effect, belief bias, cognitive reflection, pseudo-profound bullshit

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CAN WE USE SAME PREDICTORS FOR BOYS VS GIRLS PEER AGGRESSION?[2]

Using the theoretical framework of Bronfenbrenner's ecological model of peer aggression, the aim of the present study was to examine if we could use the same predictors of peer aggression at schools for boys and girls. The research included 880 participants, elementary school students from the fifth to the eighth grade, who self-estimated aggressive behavior toward their peers, affective empathy, impulsivity, parental behavior, peer acceptance, a number of friends, exposure to media, school climate, perception of neighborhood dangerousness, and also nominated aggressive peers and gave data about the school achievement and a number of friends. The same number of their parents gave data about family SES, while 107 teachers estimated attendance of parents at the parent-teacher meetings and other school events. Multivariate multilevel modeling revealed different predictors of boys vs girls peer aggression. Selected predictors of ecological model better explained peer aggression in boys than in girls. The main differences were in individual characteristic and family microsystem, whereas more statistically significant predictors were for boys, while some distal predictors in an interaction with individual characteristics and family microsystem were important in the explanation of boys' aggressive behavior. The overall results indicate that gender, as a biological category, had a strong influence on peer aggression. Psychological characteristics, as well as parental upbringing, better explained boys' than girls' aggressive behavior. These findings are very important for the school policy, which means that the intervention and prevention programs for peer aggression should differ depending on the child's gender.

Key words: gender, ecological model, peer aggression, predictors

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Introduction

Gender as Predictor of Peer Aggression

Gender is probably the most examined individual characteristic of peer aggression. Almost all studies have shown that boys are more physically and verbally aggressive toward their peers (Espelage, Bosworth, & Simon, 2000). Olweus (2010) has shown that boys are more physically and verbally aggressive than girls, and furthermore, equally or even more aggressive when it comes to indirect and relational types of aggression, especially for the primary school children. Gender differences in verbal aggression decrease with age, while they stay throughout the adulthood for physical aggression. Data are not so clear for indirect and relational types of aggression, indicating more indirect aggression for girls in adolescence (Björkqvist, 2018; Dinić, Sokolovska, Milovanović, & Oljača, 2014; Olweus, 2010).

One of the most examined approaches is the social-ecological perspective, which takes account of reciprocal interplay among individuals involved in the peer aggression, and its complex contexts is Bronfenbrenners' ecological model (Bronfenbrenner, 1979; Espelage & Swearer, 2004; Olweus, 1998). The child (individual) is in the center of ecological model, with his/her own psychological, biological, and behavioral characteristics, which represent the infrasystem. Individual factors influence the way in which the child is involved in aggression: as a perpetrator or a victim (Espelage & Swearer, 2004). The child is surrounded with different contexts which he/she interacts in. The microsystem is the closest context and has a direct influence on the child's development. The microsystem usually includes the child's interaction with the family, peers and the school. Relations in the microsystem or the interaction between different microsystems (e.g., interaction of the family and the school system) make a mesosystem. The exosystem has a distal influence on the child's development, which refers to the indirect environmental influence on the child (e.g., community and neighborhood). The exosystem variable influences the child through his/her microsystem (e.g., influencing his/her family or the school). The most distal context is the macrosystem that refers to broader social context, like the culture and country policies (Slee & Shute, 2003). Applying ecological approach to the problem of peer aggression, numerous studies have shown that being a male is a significant predictor of peer aggression and bullying. For example, Kim, Orpinas, Kamphaus, and Kelder (2011) first tested influences of four risk domains (individual, family, community and media) on the development of peer aggression, and found that being a male was a statistically significant predictor of peer aggression. Lee (2011) tested all levels of the ecological model on American and Korean students, and showed for both groups of students that being a male was a good predictor of bullying. You, Kim, and Kim (2014) study on Korean secondary school students found that being a male was a significant predictor for verbal and physical bullying (You et al., 2014).

Furthermore, the same results were obtained for Taiwan students (Wei, Williams, Chen, & Chang, 2010), and also for Croatian students (Velki, 2018b).

However, studies that would examine a moderate role of gender in predicting peer aggression are lacking, especially in Europe. In Serbia, one study examined a moderate role of gender in the relationships between empathy and peer violence among adolescents (Dinić, Kodžopeljić, Sokolovska, & Milovanović, 2016), but starting point was not the ecological model of human behavior. Different cultural influences in Europe vs USA, especially in the traditional countries like Croatia (Ilišin, Bouillet, Gvozdanović, & Potočnik, 2013; Sekulić, 2014), could also have more effect on gender differences in all the levels of the ecological model. This is more obvious in more traditional countries, where the gender differences are greater (Rajhvajn Bulat, & Ajduković, 2012; Keresteš, 2002). The main purpose of this study was to examine these gender differences in predicting peer aggression in the traditional European country like Croatia.

Gender Differences in Potential Predictors of Peer Aggression

The most prominent gender differences in the potential predictor of peer aggression were found on an individual level and within the family microsystem, i.e., parental upbringing of children.

Deficiency in empathic concern and compassion was connected to antisocial and aggressive behavior in many studies (Espelage, Mebane, & Adams, 2004; Feshbach, 1997). Gender differences in empathy were found mostly for the affective aspect of empathy (i.e., empathic concern about other people's feelings), whereas boys showed a lower level of affective empathy (Kaukianien et al., 1999; Özkan & Gökçearslan, 2009). Also, there was stronger correlation to aggressive behavior and bullying for boys (Carlo, Raffaelli, Laible, & Meyer, 1999; Espelage & Swearer, 2004; Gini, Albiero, Benelli, & Altoè, 2007). In the study on secondary school students, gender moderated only the relation between cognitive empathy and physical violence, in a way that there was a significantly negative relation only among boys (Dinić et al., 2016).

Generally, the studies have shown that a hyperactive behavior, especially in children within dominate problems of impulsivity, is associated with aggression toward peers and bullying (Craig, 1998; Velki & Dudaš, 2016). Impulsive children have lower threshold on frustration, and consequently they act more aggressively in different situations (Olweus, 1998). Furthermore, ADHD is more commonly diagnosed in boys than girls, 4 vs. 1, (Velki, 2018a) and the dominant symptoms for boys are hyperactivity and impulsivity, which usually significantly interfere with peer interactions (Biederman et al., 2002; Cantwell, 1996; Ramtekkar, Reiersen, Todorov, & Todd, 2010; Rucklidge, 2010; Velki & Romstein, 2016).

Many studies have shown that parental upbringing have a direct influence on the children's aggressive behavior, for example a higher level of parental discord (You et al., 2014), low parental monitoring, and parental attitude supporting

fighting (Kim et al., 2011), more inductive parenting (Lee, 2010, 2011), harsh discipline and physical punishment (Schwartz, Dodge, Pettit, & Bates 1997; Shields & Cicchetti, 2001), lack of parental warmth and support (Olweus, 1998; Veenstra et al., 2005), were associated with aggressive behavior and bullying. What is more important is that these findings are under the influence of gender differences, which means that parents treat boys and girls differently (Zahn-Waxler, Shirtcliff, & Marceau, 2008), especially in a traditional society such as the post war society of Croatia (Groebel, 1999; Keresteš, 2002). Generally, the parenting style for boys promotes rough-and-tumble practices (Maccoby & Martin, 1983; Ruble & Martin, 1998), and use of more physical control and punishment (Endendijk et al., 2017; Kochanska, Barry, Stellern, & O'Bleness, 2009; Lytton & Romney, 1991), whereas the parenting practices for girls promote caring and close interpersonal relationships (Gilligan, 1982), while the parental control is characterized by support, empathy and interpersonal closeness (Wood & Eagly, 2012). Furthermore, meta-analytic studies in the Western countries have revealed that parents use more physical punishment for boys (Lytton & Romney, 1991), while mothers use more supportive speech with girls (Leaper, Anderson, & Sanders, 1998). Generally, it could be concluded for the traditional society that the parenting style for girls is more sensitive and supportive with more warmth and interpersonal closeness, while it is more harsh and disciplining with use of power for boys (Mandara, Murray, Telesford, Varner, & Richman, 2012; Tamis-LeMonda, Briggs, McClowry, & Snow, 2009).

Although a significant number of the above-mentioned studies have found gender differences in some personal and family characteristics, these differences have not yet been put in a direct connection to peer aggression. Furthermore, there were no studies starting from the ecological models, taking into account all the levels of the model, which tested gender differences in prediction of peer aggression.

Current Study

The study goal was to determine the gender differences in predicting peer aggression among primary school children in Croatia, Europe, by applying Bronfenbrenner's ecological model. The predictors for boys' and girls' peer aggression were tested separately. In addition, the outcome variable, aggression toward peers, was a multivariate measure that consisted of three measures of aggressive behavior towards peers**.** The previous researchers found gender difference in peer aggression, i.e., boys being more aggressive toward their peers than girls (Olweus, 2010). Furthermore there were found some gender differences in personal traits (a lower level of empathy and a higher level of impulsivity within boys; Carlo et al., 1999; Gini et al., 2007; Velki & Dudaš, 2016), and moreover in parental upbringing (more harsh discipline and more autonomy in traditional upbringing of boys, and more warmth and inductive reasoning for girls; Kochanska et al., 2009; Mandara

et al., 2012; Tamis-LeMonda et al., 2009; Velki & Bošnjak, 2012). Therefore, it was assumed that these gender differences would also have influences on the prediction of peer aggression. As variables from the distal level of ecological model did not have a direct influence on the child's behavior, but had an indirect influence through variables on the closer level of the ecological model (Bronfenbrenner, 1979), it was assumed that gender differences in prediction of peer aggression would be found only for interactions between variables from proximal (microsystem and mesosystem) and distal levels (exosystem), and not for variables from the distal level per se. Variables from the distal level could predict peer aggression in the same way for both genders.

Hypotheses

H1: Different predictors of peer aggression in boys and girls would be found on an individual level of Bronfenbrenner's' ecological model (i.e., personal traits such as the level of impulsivity and empathy, i.e., empathy and impulsivity are more strongly related to peer aggression among boys than among girls).

H2: Different predictors of peer aggression in boys and girls would be found on the microsystem level of Bronfenbrenner's' ecological model (i.e., family characteristics such as parental punishment, autonomy and warmth).

H3: Different predictors of peer aggression in boys and girls would be found on the mesosystem level of Bronfenbrenner's' ecological model (i.e., family characteristics in interaction within the school variables, such as parents' attendances at PTA, and the family income inequality among the students in the same class).

H4: At a distance level, exosystem, there would be no gender difference in prediction of peer aggression since these variables do not have a direct influence on students. Instead, they influence the closer level of ecological model through variables.

H5: Different interaction effects would be found for boys and girls as a consequence of different gender predictors on the closer level of ecological model (i.e., individual, micro, and meso-system level variables).

Method

Participants

Elementary school students from the eastern part of Croatia were chosen to participate in the research. Students from the fifth to the eighth grade from 58 classes from 6 schools participated in the research. The average number of students in a class was M = 22.72 (SD = 4.23), ranged from 14-33 students per class. A total number of participants was 880 students (52% of girls), as well as their parents (N = 880, 19% of fathers, 61% of mothers, and 20% of those who did not check

the gender). The average age of students was *M* = 12.8 (*SD* = 1.15), with the range from 10 to 15 years. Students' teachers (*N* = 107) also participated in the research (10.2% of male, 82.2% of female and 7.6% of those who did not check the gender).

Instruments

Demographic data. Students filled out a special form with demographic data, e.g., age, gender, a number of best friends, peer acceptance (2 items), and the school achievement (6 grades: the academic achievement from the previous grade and term, the final grade in Mathematics and Croatian at the end of the previous school year, and at the end of the previous term).

Peer Aggression among School Children Questionnaire (Velki, 2012). This instrument was designed for the self-assessment of peer aggression and victimization based on the behavioral approach, and it consisted of two scales (*k* = 38). The scale of peer aggression among children measured the frequency of aggression committed against peers at school, and the scale of peer victimization measured the frequency of experienced aggression at school. Only the scale of peer aggression was used for the purpose of this research. The scale of peer aggression among children (*k* = 19) consisted of items describing verbal aggression (the item example: *I spread gossip about someone*), physical aggression (the item example: *I hit or push someone*) and cyber aggression (the item example: *I insult others through social networks, like Facebook, Twitter, etc.*). Children indicated the frequency of every committed form of aggression on a 5-point Likert scale (from "*never*" to "*always/nearly every day*"). The result for the scale was computed as an arithmetic mean of responses to the corresponding items. The internal consistency for Peer Aggression Scale was Cronbach α = .83.

Peer Nomination and Self-nomination of Peer Aggression (Velki, 2012). The sociometric technique of peer nomination and self-nomination of peer aggression based on the definitional approach was applied in the research. The students were given definitions of three different types of peer aggression (verbal, physical, and cyber), and were asked to nominate the classmates from the name list of their class who behaved in the described way more often than the other students from the class. It was possible for a student to nominate himself/herself for the aggressive behavior. The definition of verbal peer aggression included behaviors such as teasing, gossiping, mocking, insulting, etc. The definition of physical peer aggression described a person who punched, pushed, hurt, threatened, etc. The definition of cyber peer aggression was also presented. The total score of peer nomination for every student was formed based on the proportion of nomination from all the students who filled peer nomination and theoretically ranged from 0 (without any nomination/self-nomination) to 3 (nomination/self-nomination for all three types of peer aggressive behavior).

Empathy questionnaire (Ivanović & Buško, 2008). Empathy questionnaire measured the degree of empathy in the primary school students (from the

fifth to the eighth grade), and it was divided into two parts (k = 22): affective and cognitive aspects of empathy. As cognitive aspects of the empathy scale had low internal consistency, only the affective aspect of the empathy scale was used for the purpose of the research. The affective aspect of empathy (k = 10) was defined as the experience of emotion as a reaction to the emotional state of another person, and only this subscale was used in the research (the item example: *I enjoy watching when someone opens a gift and looks happy*). Participants indicated their agreement with the described behavior on a 5-point Likert scale (from "*does not apply to me at all*" to "*it fully applies to me*"). The result for the subscale was computed as an arithmetic mean of responses to the corresponding items, and theoretically ranged from 0 to 4. The internal consistency for the subscale of affective empathy was satisfactory, Cronbach α = .79.

Parental Behavior Questionnaire (Keresteš et al., 2012). Parental Behavior Questionnaire examined the most common behavior of a mother and a father towards a child. There were three versions of the questionnaire, for the mother, for the father, and for the child. Only a version of the questionnaire for a child, which consisted of two identical questionnaires, one related to the mother's behavior, and the other to the father's behavior, was used in this research. Each of these two questionnaires consisted of 29 items. Participants indicated their agreement with the described mother's/father's behavior on a 4-point Likert scale (from "*not true at all*" to "*completely true*"). The result for each subscale was computed as an arithmetic mean of responses to the corresponding items, and theoretically ranged from 1 to 4. The questionnaire had a total of 7 subscales: Warmth (k = 4, e.g., *He/She shows me he loves me*), Autonomy (k = 4, e.g., *He/She admits me and respects as person*), Intrusiveness (k = 4, e.g., *He/She interrogates me about everything*), Supervision (k = 4, e.g., *He/She knows my friends well*), Permissiveness (k = 3, e.g., *He/She is being permissive to me*), Inductive Reasoning (k = 5, e.g., *He/She explains me why I need to abide by the rules*) and Punishment (k = 5, e.g., *He/She yells when I behave badly*). Combined scores of mother's and father's behavior was used for the purpose of the research. The internal consistency of subscales ranged from Cronbach α = .70 to α = .86. In preliminary analysis subscale Permissiveness did not have significant correlation with peer aggression r = .06 (p > .05), so it was left out from further analysis.

Impulsivity Scale (Vulić-Prtorić, 2006). Impulsivity scale was a part of the wider self-assessment HIP scale (Scale hyperactivity-impulsivity-attention, k = 19) designed to assess hyperactive, impulsive behaviors and attention problems. Only Impulsivity scale (k = 4, e.g., *Interrupt or disturb others in what they do or say*) was used for the purpose of the research, on which participants self-evaluated the frequency of the described behavior that occurred to him/her in the last 6 months on a 5-point Likert scale (from "*never*" to "*very often*"). The result for the subscale was computed as an arithmetic mean of responses to the corresponding items, with internal consistency Cronbach α = .72.

Scale of Perception of Neighborhood Dangerousness (Velki, 2012). Scale of Perception of Neighborhood Dangerousness consisted of 6 items that measured

different types of dangerousness to which children were potentially exposed in the neighborhood. It was a self-assessment scale on which participants indicated their agreement with the statements (e.g., *There's a drug in my neighborhood*) on a 5-point Likert scale (from "*strongly disagree*" to "*strongly agree*"). The total score was computed as an arithmetic mean of responses to all items. Internal consistency was Cronbach α = .81.

Exposure to the Media Scale (Velki, 2012). This self-report scale consisted of three items related to the amount of time children spent with media (watching TV daily, playing computer games, and browsing the Internet weekly). Students indicated the frequency of time spent with every media on a 5-point Likert scale (from "*never*" to "*more than 10 hours of watching television per day and more than 10 hours per week for the Internet and computer game*"). The total score was obtained as an arithmetic mean of answers to all the items. Internal consistency was Cronbach α = .66.

Croatian School Climate Survey for students (Velki, Kuterovac Jagodić & Antunović, 2014). Croatian School Climate Survey for students measured a global school climate, i.e., the sense of safety and belonging to the school, the relationship of teachers and students, and parental involvement at school. It was a self-assessment scale (k = 15) on which participants indicated their agreement with statements (e.g., *I enjoy learning in my school*) on a 5-point Likert scale (from "*strongly agree*" to "*strongly disagree*"). The total score was computed as an arithmetic mean of responses to all items. Internal consistency was Cronbach α = .92.

Attendance of Parents at the Parent-Teacher Meetings and Other School Events (Velki, 2012). To evaluate the frequency of parents' attendance to individual meetings, PTA meetings, and school events, homeroom teachers were asked to estimate the frequency of parents' arrivals. The homeroom teacher evaluated parents' arrival on a 3-point Likert scale by circling the corresponding number, whereas "1" meant that parents of that child never came, "2" that parents of that child sometimes came and "3" that parents of the child regularly came. The total score was computed as an arithmetic mean of two responses.

Socio-economic Status of the Family (SES: Velki, 2012). The parents provided data on socio-economic status of the family. Three different aspects related to socioeconomic status (employment, income and education level) were measured. A parent who filled out the questionnaire had given the information for himself/herself and for the other parent (the child's father/mother). The parents' answer for every aspect of SES was scored from 1 (lowest SES) to 4 (highest SES). The total score was computed as an arithmetic mean of all items (k = 6). Parents gave demographic data about gender and age, and also about the age of their partner.

Procedure

Ethical Commission of the Faculty of Social Sciences at University of Zagreb (Study of Psychology), and Ethical Commission of the Faculty of Education at Uni-

versity of Osijek approved the research. Cross-sectional data were collected during the summer school semester. During the teachers' meeting, it was explained how the research would be carried out. Also, all the teachers were asked to complete Croatian School Climate Survey for teachers and Policy against bullying at schools. For parents who did not come to PTA, the written material was send to their home. The homeroom teachers were asked to prepare a list of students from their class, so that the instruments (a sociometric procedure) could be prepared. At the next PTA meeting, the main researcher explained the purpose of the research and asked parents for a written consent for the child's participation. About 70% parents gave the informed consent for their and children's participation in the research. Parents also gave data about the family socio-economic status. Students' data were collected collectively during classes at schools. Before the data collection, students were clearly reminded of possibility to give up at any time, and they were guaranteed confidentiality of the data obtained in the research. Data collection lasted for about 45 minutes. During students' filling out the questionnaires, the homeroom teachers evaluated the frequency of parents' attendance to PTA and other school events.

Results

Most of the variables were obtained based on the arithmetic means of the above-described items of the questionnaires and scales. The average values of the sum of the students' academic achievement from the previous year and from the previous term were used for the variable School Achievement. The index of income inequality was obtained on the basis of the families' socioeconomic status. It provided a more precise measure of inequality within a particular group, in this case within the class which the child attended.

All the variables met the assumptions for conducting the multivariate multilevel modeling analysis (variances were not zero, there was no perfect multicollinearity, the predictors were not correlated with the external variables, assumptions about normal distribution of errors and linearity were also met).

Multivariate Multilevel Modeling

At the first level of the model, the latent construct or the multivariate outcome (a measurement model) was defined, which consisted of three measures of aggressive behavior towards peers (self-assessment of aggressive behavior, peer nomination, and self-nomination for aggressive behavior), previously set up to *z*-scores. In order to facilitate the interpretation, all predictor variables were centered on the overall mean (grand-mean centering method).

At the second level, variables that varied within a group (i.e., among the students) were defined. The following variables were tested as predictors: infrasystem: age, af-

fective empathy, impulsivity; microsystem-family: parental punishment, parental inductive reasoning, parental warmth, parental autonomy, parental supervision, parental intrusiveness; microsystem-peers: number of friends, peer acceptance; microsystem-school: school success; exosystem; time spent using media, and perception of neighborhood dangerousness. At the third level, variables that varied between classes were defined. Three variables were tested as predictors: the school climate (estimated by the students - microsystem-school), parents' attendance at the PTA meetings and other school events (mesosystem), and the index of income inequality (mesosystem). At the fourth level, variables that varied between schools (e.g., school policies against bullying, and the school climate assessed by the teachers) were defined, but the intraclass correlation coefficient (ICC) did not show a statistically significant variation between schools, so these variables were excluded from the further analysis. Therefore, the model that had 3 levels had been tested, and the above described analysis had been repeated twice separately for boys and girls. The analyses were done on the variance components (VC) of the covariance structure matrix by using the ML (maximum likelihood) estimation method. First, the basic models (Model A and Model A1) were tested with all the potential predictors. Then, there were tested variations of predictors from the second level of the model (between students), and from the third level (between classes), and models were built with significant variations. Afterwards, the potential interactions were tested, and final models (Model B and Model B1) were built based on significant interactions. Comparisons of the obtained model were tested by using the indicators of model fit.

Table 1 shows the basic descriptive statistics of all variables included in the research. Most of the variables were obtained based on the arithmetic means of the above-described items of questionnaires and scales. For the variable School Achievement, there were used the average values of the sum of the students' academic achievement from the previous year (a general achievement, the mathematics grade and the grade form Croatian) and from the previous term (a general achievement, the mathematics grade and the grade from Croatian). The achievement in mathematics and Croatian (with the general academic achievement at the end of the school year/term) was chosen because students in the primary school mostly had very good and excellent grades. This decreased the variability of the general academic achievement. Croatian and mathematics were usually considered to be the basic subjects in the primary school. Therefore, the criteria were more severe in comparison to some other subjects (Vrdoljak & Velki, 2012). Thus, it was expected that the variability would be higher in these variables in relation to the general academic achievement.

The index of income inequality was obtained on the basis of the families' socioeconomic status. It provided a more precise measure of inequality within a particular group, in this case within the class which the child attended. The value span ranged from 0 (representing the same income group) to 1 (representing a maximum inequality within the group). The index of income inequality was calculated based on Deatons' formula (1997):

$$G = \frac{N+1}{N-1} - \frac{2}{N(N-1)u}(\Sigma_{i=1}^{n} P_i X_i)$$

whereas *N* was a number of participants, u an average population income (the average SES for the specific class), *P* a rank of income of persons *i*, with income *X* (SES of that person). Accordingly, the richest person had a rank 1, and the poorest person had a rank *n*.

Table 1
Descriptive statistics for all variables included in the research

Variables	*N*	*Min*	*Max*	*M*	*SD*	*Sk*	*Ku*
Variables on the first level (multivariate outcome)							
self-assessment of aggressive behavior	879	1.00	3.42	1.30	0.30	2.50	3.73
self-nomination for aggressive behavior	720	0.00	3.00	0.46	0.72	1.67	2.51
peer nomination for aggressive behavior	720	0.00	3.00	0.24	0.56	2.46	3.82
Variables on the second level							
affective empathy	879	0.20	4.00	2.96	0.70	-1.00	1.15
impulsivity	869	1.00	5.00	2.40	0.79	0.63	0.63
number of friends	879	0.00	25.00	4.34	3.51	1.66	3.13
peer acceptance	879	1.00	3.00	2.64	0.48	-1.27	1.00
school achievement	876	1.17	5.00	3.75	0.89	-0.37	-0.74
parental inductive reasoning	877	1.00	4.00	3.12	0.64	-0.66	-0.15
parental punishment	874	1.00	4.00	2.11	0.63	0.37	-0.19
parental warmth	874	1.00	4.00	3.56	0.52	-1.62	2.52
parental autonomy	872	1.00	4.00	3.52	0.50	-1.38	2.02
parental intrusiveness	870	1.00	4.00	2.17	0.69	0.38	-0.39
parental supervision	874	1.00	4.00	3.17	0.64	-0.73	0.10
time spent using media	873	1.00	5.00	2.83	0.87	0.48	-0.57
neighborhood dangerousness	870	1.00	5.00	4.18	0.76	-1.27	1.71
Variables on the third level							
school climate	880	1.41	3.35	2.32	0.42	0.52	-0.11
index of income inequality	880	0.02	0.17	0.09	0.03	0.41	1.42
parent's attendance at school	880	1.68	3.00	2.26	0.29	-0.74	-0.79

Notes. N - number of participants*; Min* - minimum*; Max* - maximum*; M* - arithmetic mean*; SD* - standard deviation*; S* - skewness*; K* - kurtosis.

Results have shown (Table 2) that 23% (level 2; ICC=0.2300) of the total variability in boys' peer aggression can be explained by differences among stu-

dents, while only 6.55% (level 3, ICC=0.0655) of the total variability can be explained by differences among classes. For girls' peer aggression, 27.15% (level 2, ICC=0.2715) of the total variability can be explained by differences among students and 6.66% (level 3, ICC=0.0666) of the total variability can be explained by differences among classes.

Table 2
Estimates of null model of multilevel modeling for the criterion variable peer aggression for boys and girls

	Parameters	Boys	Girls
Fixed effects	Intercept	.119*	-.110*
Variance components			
Level 1	variability in aggression (individual differences)	.909**	.467**
Level 2	variability in aggression within classes	.297**	.191**
Level 3	variability in aggression between classes	.085*	.047*
Indicators of model fit			
	-2 Log Likelihood	3270.772	2660.173
	Akaike's Information Criterion (AIC)	3278.768	2668.173
	Hurvich and Tsai's Criterion (AICC)	3278.812	2668.214
	Bozdogan's Criterion (CAIC)	3302.740	2692.241
	Schwarz's Bayesian Criterion (BIC)	3298.739	2688.237

Note. * $p < .05$. ** $p < .01$.

The predictors of boys' peer aggression explained 50.43% of the variance on the level 2 (between students), but nonetheless significant 14.09% still remained unexplained. On the third level, 60.54% of the variance (between classes) was explained, and another 3.19% of unexplained but insignificant variance (Table 3, variance components in Model A) remained.

For girls' peer aggression on the level 2 (between students), predictors explained 48.93% of the variance, but still remained significant 17.73% of unexplained variance. On the third level, predictors explained 58.21% of the variance (between classes), and another 3.56% of unexplained but insignificant variance remained (Table 3, variance components in Model A1).

Table 3
Predictors' models of multilevel modeling for peer aggression for boys and girls

		Boys		Girls	
		Model A	Model B	Model A1	Model B1
Fixed effects estimates	Intercept	.026	.019	-.047	-.041
Level 2	age	.051	.048	-.027	-.026
	affective empathy	-.148**	-.148**	.005	-.007
	impulsivity	.292**	.271**	.331**	.325**
	number of friends	-.010	-.023	-.014	-.024
	peer acceptance	-.086	-.079	-.022	-.035
	school achievement	-.050	-.041	-.042	-.039
	parental inductive reasoning	.165*	.155*	.044	.016
	parental punishment	.222**	.212**	.050	.055
	parental warmth	.151	.153	-.142*	-.146*
	parental autonomy	-.211*	-.221*	.076	.108
	parental intrusiveness	-.065	-.057	.007	.013
	parental supervision	-.071	-.081	-.051	-.068
	time spent using media	.116**	.103*	.067*	.065*
	neighborhood dangerousness	.153**	.123**	.163**	.158**
Interactions on the second level	parental punishment x neighborhood dangerousness	-	.138*	-	-
Level 3	school climate	.231*	.216*	-.032	-.027
	parents attendance at the school	.004	.014	.263*	.277*
	index of income inequality	6.755**	6.577**	.796	.797
Interactions between second and third level predictors	neighborhood dangerousness x school climate	-	.309**	-	-
	neighborhood dangerousness x income inequality	-	4.234*	-	-
	impulsivity x parents attendance at the school	-	-	-	.389**
Variance components					
Level 1	variability in aggression (individual differences)	.865**	.866**	.434**	.433**
Level 2	variability in aggression within classes	.147**	.125**	.098**	.093**

Level 3	variability in aggression between classes	.033*	.029	.020	.019
Indicators of model fit					
	-2 Log Likelihood	2979.74	2961.31	2434.30	2423.67
	Akaike's Information Criterion (AIC)	3021.742	3009.314	2476.301	2467.671
	Hurvich and Tsai's Criterion (AICC)	3022.653	3010.491	2477.15	2468.602
	Bozdogan's Criterion (CAIC)	3146.731	3152.154	2602.486	2599.869
	Schwarz's Bayesian Criterion (BIC)	3125.731	3128.147	2581.488	2577.873
Degrees of freedom	Number of parameters	21	24	21	22

Note. * $p < .05$. ** $p < .01$.

There were significant interactions of predictors on the second level of the model, and also there were significant variations of the second level predictor variables between classes (Table 4), so the final model was the Model B and B1.

Table 4
Variations of predictors from the second level of the model (between students), on third level (between classes) for peer aggression for boys and girls

Variance components		Boys	Girls
Level 1	variability in aggression	.863**	.433**
$Intercept_2$	within classes	.048	.030
	affective empathy	.061	-
	impulsivity	.005	.031*
	parental inductive reasoning	.044	-
	parental punishment	.000	-
	parental autonomy	.000	-
	parental warmth	-	.055*
	time spent using media	.012	.032*
	neighborhood dangerousness	.068*	.029
$Intercept_3$	between classes	.024	.018

Note. * $p < .05$. ** $p < .01$.

Model fit for multilevel models of boys' and girls' peer aggression (Table 3) was tested by using the χ^2 likelihood ratio test. Comparison of Model A with Model

B, $\chi^2 = 18.434$, $p < .01$, showed statistically significant improvement of model fit for Model B. Also, other indicators of model fit (AIC and AICC; Table 3) showed better model fit of Model B compared to models A. Therefore, it was decided to take into account the Model B as a final solution for the prediction of boys' peer aggression. The same results were obtained or girls' peer aggression. Comparison of Model A1 with Model B1, $\chi^2 = 10.628$, $p < .01$, showed a statistically significant improvement of model fit for Model B, while the other indicators of model fit (AIC, AICC, CAIC and BIC; Table 3) showed better model fit of Model B1.

Model B obtained the following significant predictors of boys' peer aggression that explained the variability between students: more impulsive behavior, less empathy, more parental punishment, more parental inductive reasoning, less parental autonomy, more time spent with media, and a greater perception of neighborhood dangerousness. There were two significant predictors on the third level, more negative school climate and index of income inequality (higher inequality), which explained the variability between classes. Furthermore, the model B had three significant interaction effects, i.e., between parental punishment and the perception of neighborhood dangerousness (Figure 1), between perception of neighborhood dangerousness and the school climate (Figure 2), and between perception of neighborhood dangerousness and income inequality (Figure 3).

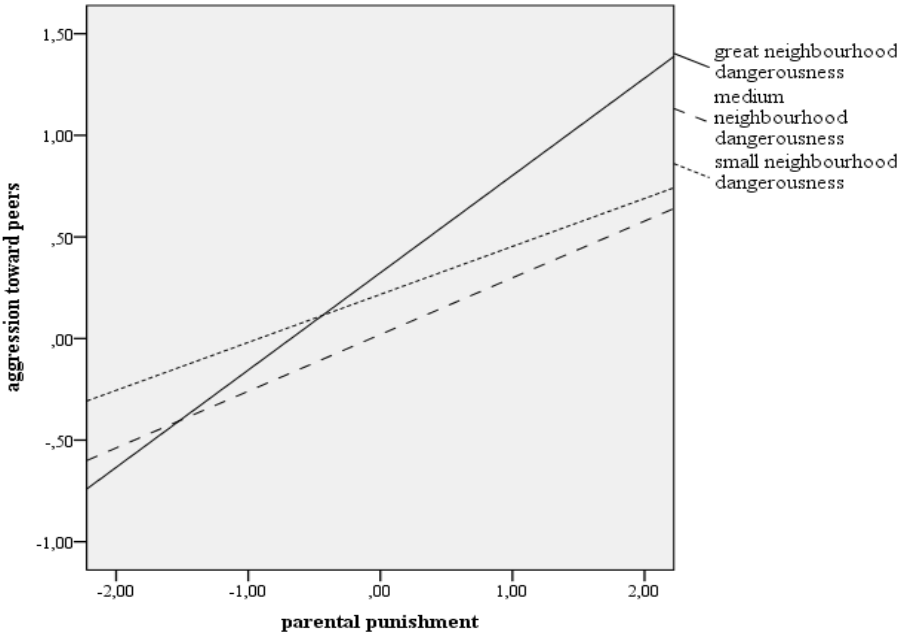

Figure 1. Interaction effects between parental punishment and perception of neighborhood dangerousness for aggression toward peers on the second level of the model (within the class) for boys.

Figure 1 shows the interaction effect of parental punishment and perception of neighborhood dangerousness on the second level of the model. In cases where the student perceived great neighborhood dangerousness, the parental punishment was more associated with boys' aggression towards their peers, but in situations where students perceived medium or low neighborhood dangerousness, this correlation was weaker.

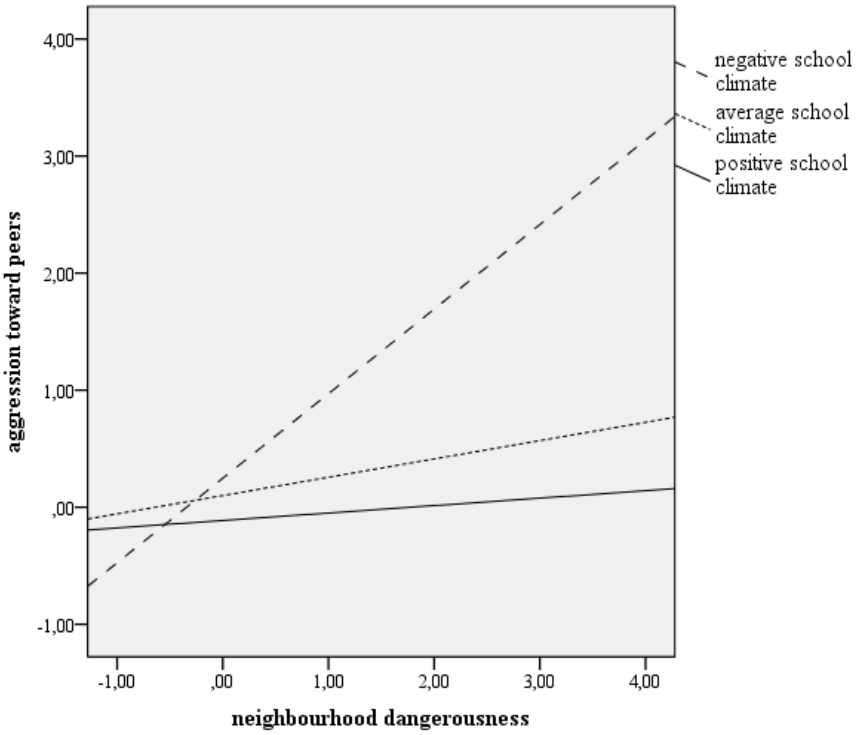

Figure 2. Interaction effects between perception of neighborhood dangerousness and the school climate for aggression toward peers on the third level of the model (between the class) for boys.

Figure 2 shows the interaction effect of perception of neighborhood dangerousness and the school climate on the third level of the model. In classes where students perceived negative school climate, the perception of neighborhood dangerousness was more strongly associated with boys' aggression towards peers. On the contrary, in classes where students perceived a positive school climate, there was almost no association between perception of neighborhood dangerousness and boys' aggression.

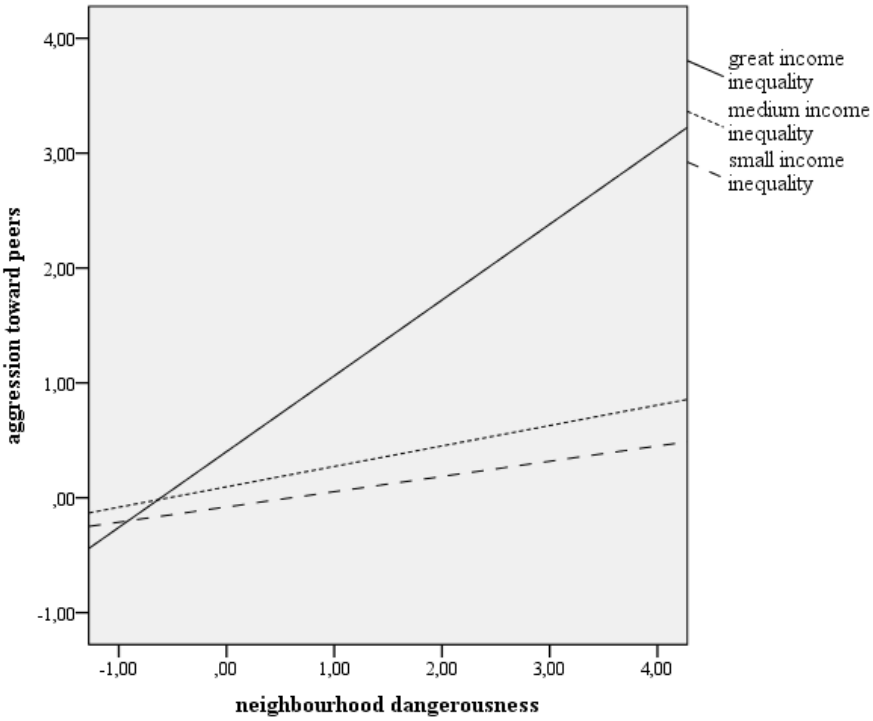

Figure 3. Interaction effects between perception of neighborhood dangerousness and income inequality for aggression toward peers on the the third level of the model (between the class) for boys.

Figure 3 shows the interaction effect of perception of neighborhood dangerousness and income inequality on the third level of the model. In classes where students perceived great income inequality between their families, perception of neighborhood dangerousness was more strongly associated with boys' aggression towards peers. However, in classes where students perceived low- or no-income inequality, there was almost no association between perception of neighborhood dangerousness and boys' aggression.

Model B1 obtained the following significant predictors of girls' peer aggression that explained the variability between students: more impulsive behavior, less parental warmth, more time spent with media, and a greater perception of neighborhood dangerousness. There was only one significant predictor at the third level, parents' attendance at school, which explained the variability between classes. Furthermore, the model B1 had one significant interaction effects, i.e., between impulsivity and parents' attendances at school (Figure 4).

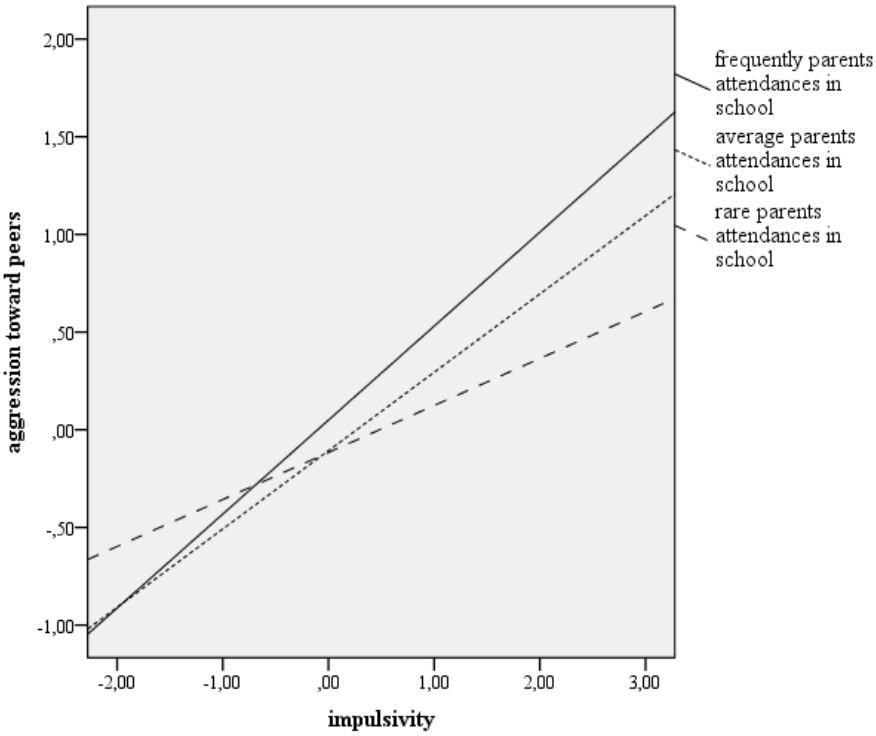

Figure 4. Interaction effects between impulsivity and parents' attendances at school for aggression toward peers on the third level of the model (between the class) for girls.

Figure 4 shows the interaction effect of impulsivity and parents' attendances at school on the third level of the model. In classes where parents often came to PTA, impulsivity was more strongly associated with girls' aggression towards peers, but in classes where parents rarely came to PTA, the association between impulsivity and girls' aggression was somehow weaker, but still significant.

Discussion

In accordance with the study goal, predictors for boys' and girls' aggression toward peers were checked separately and interpreted within the ecological perspective.

From an individual level of Bronfenbrenner's' ecological model, different predictors for boys' and girls' prediction of peer aggression were confirmed. Lower level of affective empathy was a significant predictor only for boys' aggressive behavior, but not for girls. Girls generally showed more empathic behavior (Espelage

& Swearer, 2004) and a genuine concern about other peoples' emotions than boys did. In contrast, boys with lower levels of affective empathy did not sympathize with other children, and showed no concern for their feelings without realizing that their aggressive behavior could hurt other children. Furthermore, higher degree of impulsivity in both boys and girls was a significant predictor of aggression toward peers. Interestingly, impulsiveness was a stronger predictor for girls than for boys. Such results could be explained by normative beliefs whereas boys' impulsive behavior was being more tolerated, especially in a traditional society like Croatia (Sekulić, 2014; Velki, 2018b). Moreover, the researches have shown that boys are more impulsive than girls (Craig, 1998). A smaller amount of impulsive behavior is considered a normal developmental feature of boys, and only high or extreme impulsiveness can be noted in connection to aggression. For girls, different normative beliefs prevail, girls are quieter and more peaceful than boys are, and a slight deviation from the average impulsive behavior in girls can be a good predictor of aggressive behavior.

From the microsystem level of Bronfenbrenner's' ecological model, different family predictors underline aggression in boys and girls. More punishment, more inductive reasoning and less autonomy are good predictors of aggressive behavior for boys. Harsh discipline, especially in families subject to corporal punishment, often borders with abusive parenting has proven to be a good predictor of aggression toward peers (Ahmed & Braithwaite, 2004). Previous studies have also shown that the punishment is more often used for boys living in traditional families (Endendijk et al., 2017; Kochanska et al., 2009). In addition to punishing, corrective educational practices also include alternative punishment, with the intention to regulate unwanted child behavior, but without the use of an aversive stimulus, e.g., explanation and teaching, ignoring inappropriate behavior, etc. (Delale & Pećnik, 2009). Therefore, inductive reasoning is probably the parent's reaction to boys' aggression. Lack of child's autonomy within the family, where the parents are over-involved in the child's educational and extracurricular activities, can lead to aggressive behavior toward peers (Barber, 2002). For traditional upbringing of boys, it is usual for parents to be over-controlling (Lytton & Romney, 1991). In relationships with peers, the boys are trying to compensate for the lack of autonomy in the family, and overly want to gain independence, usually by using aggression. For girls, only a lack of parental warmth is a significant predictor of peer aggression. Upbringing of girls in more traditional society includes more sensitive and supportive parental style with more warmth (Kochanska et al., 2009; Tamis-LeMonda et al., 2009), and a lack of warmth can cause problems in other significant relationships, such the ones with peers.

Apart from gender differences in the family upbringing, another predictor on the microsystem level is significant for boys' aggressive behavior but not for girls'. It is a negative school climate. At schools where the negative school climate prevails, students have no sense of belonging to school, they do not feel safe and welcome to school (Newman, Murray, & Lussier, 2001). As boys are likely to have more problems in the relationship with the teachers, consequently they will also have more negative perception of the school climate and show more aggressive behavior.

From the mesosystem level of Bronfenbrenner's' ecological model, different predictors are significant for boys' and girls' aggression toward peers. Greater family income inequality within class that boys attend is a significant predictor of boys' aggression, which is in accordance with the previous studies (Elgar, Craig, Boyce, Morgan, & Vella-Zarb 2009; Wilkinson & Pickett, 2006). Exposure to stressful life events, such as low socioeconomic conditions (poverty, loss of work, etc. which is typical for Croatian society), increase the psychological stress of parents and indirectly leads to failure and difficulties in parenting. It is more common in a traditional society that these family problems lead to harsh discipline that is more frequent in upbringing of boys. A significant predictor of aggression for girls is parents' attendance at school. In classes where parents more often come to school, there is more aggression in girls' behavior. It is possible that in classes where there is more aggression and more general problems, parents often come to school either independently or at the invitation of teachers. Furthermore, as aggressive behavior is more common in boys, when it is more pronounced. In girls it is more deviant from norms in some way, and therefore parents are more involved in solving such problems.

At distance level of Bronfenbrenner's ecological model, exosystem, there are no gender differences in prediction of peer aggression. Both predictors, time spent using media and perception of neighborhood dangerousness were significant for boys' and girls' aggression. Although, time spent using media proved to be a slightly stronger predictor for boys. Boys often spent time playing violent computer games (Barboza et al., 2009; Genitle & Walsh, 2002) and were more likely to watch violent contents on television (Kuntsche, 2004, Pšunder & Cvek, 2012). In most violent computer games and violent movies, the main heroes were men who actually served as a model that boys imitated in the school situations. The perception of neighborhood dangerousness proved to be a slightly stronger predictor for girls. Probably due to more sensitive and warmer upbringing of girls (Mandara et al., 2012; Tamis-LeMonda et al., 2009) where aggression was not a normative behavior for them, and perhaps even a small amount of violence was sufficient for girls to adopt and pass it on in the school situations.

Finally, different interaction effects for boys and girls were confirmed. Neighborhood dangerousness had moderation effect in connection between parental punishment and aggressive behaviors in boys. If boys lived in dangerousness neighborhood, the parental punishment was more strongly associated with boys' aggressive behavior. Boys who expressed aggressive behavior could have learned such behavior within the family where punishment was present (which was more for boys living in a traditional society). Furthermore, it was possible that parents in dangerousness neighborhood were more concerned about the safety of their child and were prone to strict discipline and punishment to protect it. Moreover, it was more likely that families on the margins of poverty lived in dangerous neighborhoods, in which common practice was strict punishment that often led to a child abuse (Buljan Flander & Kocijan Hercigonja, 2003; Cicchetti & Cohen, 2006).

Another significant interaction has shown moderation effect of the school climate in connection between the neighborhood dangerousness and peer aggression in boys. In the classrooms where the negative school climate prevails, the perception of neighborhood dangerousness is more strongly associated with boys' aggression toward peers. The moderating effect of the school climate has proved to be significant in other studies (Espelage & Swearer, 2009). This finding is very important because it points to the fact that the negative impact of the community (neighborhood dangerousness) can be neutralized if the child attends the school where he feels accepted and safe.

The final significant interaction has shown moderation effects of income inequality in connection between neighborhood dangerousness and peer aggression in boys. In classrooms where large differences in the family income prevail, neighborhood dangerousness is more strongly associated with peer aggression in boys. Children easily see the material differences (e.g., clothes, mobile phones, etc.) within these classes, which can cause frustration because they cannot change their position. A boy living in a dangerous neighborhood has stored many aggressive scenarios in his memory, and when he comes to a state of frustration caused by huge and obvious material differences, he is likely to recall an aggressive scenario stored in his memory (seen or experienced in a dangerous neighborhood) and will behave accordingly (Huesmann, 1994).

Only one significant interaction has been found for girls, a moderating effect of parents' attendance at school in connection between impulsiveness and aggression in girls. In classes where parents often come to school, impulsiveness is more strongly associated with peer aggression in girls. Parents are more likely to come to school when there are more problematic behaviors, as well as impulsiveness in girls, which is closely related to aggression (Velki, 2018b). Parents will be more likely to come to school (either self-initially as parents who want to solve the problem or at the invitation of teachers) especially if the impulsive behavior occurs in girls, which is considered less normative and more deviating than in boys.

Generally, the current research has shown that the chosen predictors better explain aggressive behavior for boys than for girls. Less predictors have been significant for girls and generally, they are weaker than boys' predictors are. It can be concluded that there is a variety of factors underlying in boys vs girls aggressive behavior, and that predictors from the proximal level of Bronfenbrenner's' ecological model are more gender sensitive than the ones from the distal level.

Prevention and Policy Implications

Peer aggression mostly happens at school, during the break, lunch, on toilets and hallways, and even in the classrooms (Velki & Vrdoljak, 2013), so the prevention program is a good starting point in an educational institution, i.e., at school. As a place where children spent half, or even more, time of the day, educational experts should be the first ones introducing prevention programs at schools and in classrooms, also

including parents and the whole community in such programs. As the results of the obtained research show, different predictors influence boys' and girls' aggressive behavior. This must be taken into consideration when implementing the preventive programs. Different strategies and activities should be introduced to aggressive children, depending on their gender. Distal influence is equally important for all children, i.e., influence of media violence and neighborhood dangerousness. However, it is more important for boys to work on activities that facilitate empathy, like role-playing game or taking someone other's perspective, working on the strategies that will help them to cope with their negative emotions. Also, it is more important for boys to develop tolerance, because differences in income of their peers have appeared to be significant in prediction of their aggression. Furthermore, the school climate has been shown very important for boys' aggressive behavior, and that is something which the school can directly work on. A positive school climate, where all students feel accepted, safe and welcome, is something that is beneficial for all, including teachers, students and even parents. The obtained results have also shown different influences of parental upbringing on boys' and girls' aggressive behaviors. Harsh punishment and a lack of autonomy in boys, and a lack of parental warmth in girls, facilitate aggression in children. Knowing these differences in upbringing, the school can act as an educational institution for parents as well. Educational experts can organize lectures for parents or offer them a school counselling. Raising parents' awareness on how important is proper upbringing of children is essential for a good prevention, because it is almost impossible to achieve a long-term progress without parents help and involvement.

Contributions and Limitations of the Research

Several important contributions could be drowned from the obtained research. This is one of the first studies in Croatia, and in Europe, that has applied an integrative ecological approach to the issue of gender differences in predicting peer aggression. Previous studies have been mostly done in the USA, which has different cultural background. This is important for several reasons; firstly, the proximal and distal effects have been tested simultaneously within the specific traditional community, and secondly, gender differences for prediction of peer aggression have been tested on the same generation of students and in the same way for boys and girls, which gives us a good starting point for generalization of data for a traditional culture. Moreover, the line with practical implication can also be driven, i.e., within prevention programs that are not usually specific to gender. Furthermore, some important methodological contributions can be noted: the application of different approaches (definitional and behavioral), and methods of measurement of peer aggression (self-assessment, peer nomination, self-nomination), and collection of data on individual and contextual characteristics have been taken from several sources (i.e., students, parents and teachers), which provide a more realistic point of view.

However, it is significant to mention the shortcomings of the research. The selection of schools which participated in the survey was random, but all schools

were from one county, and only elementary school students participated in the research (from the fifth to the eighth grade), which limited the result generalization to other students' population. Although this county was the most affected by the patriotic war, and it was a good example of a traditional society, the results showed a slightly higher prevalence of peer aggression in relation to the data from the national sample (Rajhvan-Bulut & Ajduković, 2012). Some other possible limitations were the following: small proportion of students' fathers (19%) who participated in research, the research was not anonymous, which could produce socially desirable answers. Moreover, some other possible independent variables (e.g., parent's gender, self-concept, previous history of victimization, subculture, etc.), which could have influence on a child aggressive behavior, were not included in the research. Finally, the research was cross-sectional in its design.

Conclusion

The obtained research has confirmed the results from some previous studies conducted in Croatia and worldwide. Most studies of peer aggression and bullying have shown that the gender is a significant predictor (Kim et al., 2011; Lee, 2010; Wei et al., 2010; You et al., 2014), and furthermore that individual characteristics and parental styles differ depending on the child's gender (Gini et al., 2007; Mandara et al., 2012; Velki, 2018b). However, the obtained research has additionally shown that it is necessary to consider gender of perpetrators when predicting the peer aggression. Different mechanisms are found in background of boys' vs girls' aggressive behavior, which points out that it is essential to use different approaches, which are gender depending, in dealing with peer aggression at schools. In addition, it is necessary to examine gender differences in predictions of different types of peer aggression, such as physical, verbal or relational. In order to examine the influence of the society, i.e., traditional vs modern, future studies should examine the characteristics of different regions and sub-cultures, and especially the cross-cultural studies are desirable. Moreover, applying a longitudinal design is preferable.

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MOŽEMO LI ISTIM ČIMBENICIMA PREDVIĐATI VRŠNJAČKO NASILJE KOD DJEČAKA I DJEVOJČICA?

Primjenjujući ekološki pristup na problematiku vršnjačkog nasilja, cilj ovog istraživanja bio je utvrditi možemo li istim prediktorima predviđati vršnjačko nasilno ponašanje kod dječaka i kod djevojčica. U istraživanju je sudjelovalo 880 učenika (48% dječaka i 52% djevojčica) od petog do osmog razreda osnovne škole i isto toliko njihovih roditelja, kao i 107 nastavnika. Djeca su dala neke osnovne demografske podatke (dob, spol, školski uspjeh, broj prijatelja), nominirali su nasilne vršnjake te procijenili vlastito nasilno ponašanje, stupanj afektivne empatije i impulzivnosti, školsku klimu, roditeljsko ponašanje, opasnost susjedstva i utjecaj medija. Roditelji su dali podatke koji se odnose na socioekonomski status obitelji, a nastavnici koji se odnose na dolaske roditelja u školu. Multivarijantim višerazinskog modeliranjem utvrđeno je kako različiti prediktori predviđaju vršnjačko nasilje kod dječaka u odnosu na djevojčice. Općenito se pokazalo kako su odabrani prediktori bolje objasnili nasilno ponašanje za dječake nego za djevojčice. Glavne razlike bile su bile su u domenu individualnih karakteristika i obiteljskom mikrosustavu, odnosno više je statistički značajnijih prediktora dobiveno za dječake, a također su i neki distalni prediktori u interakciji s individualnim karakteristikama i obiteljskim mikrosustavom bili važni u objašnjenju nasilnog ponašanja u dječaka. Rezultati istraživanja pokazuju da je rod snažno utjecao na vršnjačku agresiju. Psihološke karakteristike, kao i roditeljski odgoj, bolje su objasnili vršnjačko nasilje u dječaka. Dobiveni nalazi su također vrlo važni za školsku politiku, tj. programi intervencije i prevencije vršnjačkog nasilja trebali bi se razlikovati ovisno o rodu djeteta.

Ključne riječi: ekološki model, prediktori, rod, vršnjačka agresija

UPUTSTVO AUTORIMA

Za objavljivanje u časopisu *Primenjena psihologija* prilažu se isključivo originalni radovi koji nisu prethodno štampani i nisu istovremeno podneti za objavljivanje negde drugde. U časopisu se objavljuju empirijski i pregledni radovi. Pregledni rad treba da sadrži originalan, detaljan i kritički prikaz istraživačkog problema ili područja u kome je autor ostvario određeni doprinos, vidljiv na osnovu autocitata. Radovi koji nisu pripremljeni prema ovom uputstvu, neće se recenzirati. Rukopisi se šalju isključivo putem platforme za prijavu, koja je dostupna na: http://primenjena.psihologija.ff.uns.ac.rs/index.php/pp/about/submissions.

U časopisu se mogu objavljivati radovi na srpskom i srodnim jezicima bivšeg srpsko-hrvatskog govornog područja, kao i na engleskom jeziku. Ukoliko rad nije na srpskom jeziku, autorova obaveza je da ga lektoriše. U slučaju jezika srodnih srpskom, redakcija zadržava pravo da pojedine termine prilagodi srpskom jeziku zarad boljeg razumevanja teksta. Sve predložene izmene se dostavljaju autorima na uvid i odobrenje.

Prilikom dostavljanja rukopisa, autori moraju navesti da se slažu sa etičkim standardima o objavljivanju u časopisu, odnosno da preuzimaju odgovornost za etičku saglasnost za sprovođenje istraživanja, kao i za dozvole o legalnom korišćenju upitnika i softvera u svojim radovima. Uredništvo zadržava pravo da traži na uvid dozvolu za prevod, korišćenje i modifikaciju instrumenata, kao i softvera. Pre prijave rada, autori se upućuju na ček listu za autore koja je dostupna na internet stranici časopisa.

Recenziranje i objavljivanje. Svi radovi se anonimno recenziraju od strane dva recenzenta. Uredništvo na osnovu primljenih recenzija donosi jednu od sledećih odluka o rukopisu: **A -** prihvatanje, **B -** prihvatanje uz korekcije, **C -** odbijanje uz sugestiju da se rad u velikoj meri koriguje i ponovo pošalje ili **D -** odbijanje. Uredništvo pismeno obaveštava autora o odluci. Ukoliko autor ponovo podnosi korigovani rad, dužan je da u obrascu recenzije odgovori na sve sugestije upućene od strane recenzenta.

Format rada. Rad mora biti napisan u tekst procesoru Microsoft Word, na stranici formata A4, fontom Times New Roman (12 tačaka), latinicom, sa razmakom od 1.5 reda, sa marginama od 2.54 cm (odnosi se na sve margine). Rad treba da bude dužine do jednog autorskog tabaka (do 30000 znakova, sa razmacima, bez referenci i priloga), a ukoliko je reč o kratkom izveštaju, rad treba da bude do 5 000 znakova (s razmacima) bez referenci i priloga. Redni brojevi strana treba da budu dati u gornjem desnom uglu, zajedno sa zaglavljem koje sadrži skraćeni naslov rada (tzv. *running head*), pisan velikim slovima, bez imena autora. Zaglavlje ne sme imati više od 50 karaktera. Paginacija bi trebalo da počinje od prve strane.

Rad treba da bude struktuiran u skladu sa IMRAD formatom i pravilima koja su definisana u 6. izdanju Priručnika Američke psihološke asocijacije (*APA Publication Manual*). Shodno tome, rad treba da sadrži odeljke *Rezime* sa ključnim rečima, *Uvod*, *Metod*,

Rezultati, *Diskusija*, *Zaključak* (opciono), *Reference*, *Prilozi* (opciono), kao i naslov i rezime sa ključnim rečima na engleskom jeziku.

Naslovna strana. Naslov treba da bude što koncizniji, ali i dovoljno precizan. Preporuka APA standarda je da naslov ne sadrži više od 15 reči. Ukoliko se u članku izveštava o nekom instrumentu koji nije opštepoznat široj naučnoj i stručnoj javnosti, naziv instrumenta je potrebno navesti u celini u naslovu rada, a ne samo skraćenicu. Ukoliko je rad nastao u sklopu projekta, iza naslova rada treba staviti fusnotu koja sadrži naziv finansijera projekta i broj projekta. Ukoliko je deo rezultata izlagan na skupu, u fusnoti treba dati podatke o skupu. Iza naslova rada slede imena autora i njihove afilijacije. Iza imena autora za korespondenciju treba staviti fusnotu koja sadrži e-mail adresu autora. Naslov rada, imena autora i afilijacije autora daju se na prvoj strani, bez ostatka teksta. Ova strana se, kao poseban dokument, prilaže na platformu, odnosno odvojeno od samog rukopisa.

Rezime. Rezime treba da bude dužine do 250 reči. Na kraju rezimea treba dati ključne reči (do pet ključnih reči). Ukoliko je rad na srpskom jeziku, potrebno je priložiti naslov, rezime i ključne reči i na engleskom jeziku. Ukoliko je rad na engleskom jeziku, poželjno je priložiti duži rezime (do 2 strane) na srpskom jeziku. Rezime po pravilu ne sadrži reference, sem ukoliko je to neophodno.

Naslovi odeljaka. Naslovi odeljaka (*Metod*, *Rezultati* i sl.) pišu se **podebljanim** slovima, „rečeničnim" formatom (velikim početnim slovom), centrirano. Podnaslovi se pišu **podebljanim** slovima, poravnato u levo i u „rečeničnoj" formi. Prvi podnaslovi stoje na marginama, a njima subordinirani podnaslovi pišu se uvučeno (takođe **podebljano**, u „rečeničnoj" formi, s tačkom na kraju). Naslovi četvrtog nivoa se formatiraju na isti način, ali se stavljaju u *kurziv.* Nazive instrumenata treba navoditi kao subordinirane podnaslove u okviru odeljka *Instrumenti*, dakle uvučeno, **podebljano**, u „rečeničkoj formi", s tačkom na kraju. Referenca za instrument je deo ovog podnaslova. Na primer:

Metod

Uzorak i postupak

Instrumenti

Eysenckov upitnik ličnosti (Eysenck Personality Questionnaire - EPQ: Eysenck & Eysenck, 1975).

Skala zadovoljstva životom (Satisfication With Life Scale - SWLS: Diener, Emmons, Larsen, & Griffin, 1985).

Rezultati

Validnost Upitnika o veštinama komunikacije

Faktorska analiza.

Interkorelacije konstrukata.

Korelacije veština komunikacije sa osobinama ličnosti.

Korelacije veština komunikacije sa emocionalnim kompetencijama.

Analiza puta.

Doslovno citiranje. Svaki citat koji je direktno preuzet iz teksta, bez obzira na dužinu, treba da prati referenca sa brojem strane. Za svaki citat duži od 350 znakova autor mora imati pismeno odobrenje vlasnika autorskih prava koje treba da priloži.

Tabele. Tabele i grafikoni treba da budu sačinjeni u Wordu ili nekom Word-kompatibilnom formatu. Tabele i grafikone iz statističkih paketa treba prebaciti u Word. Iste podatke ne treba istovremeno prikazivati i tabelarno i grafički. Podaci koji su već dati u tabeli ili na grafikonu, ne smeju se ponavljati u tekstu, već se treba samo pozvati na njih. Tabele i grafikone je potrebno pozicionirati u samom radu, odnosno nije potrebno da se prilažu kao posebni dokumenti na platformu, već u sklopu rukopisa. Svaka tabela treba da bude označena brojem i adekvatnim nazivom. Broj tabele treba da bude napisan običnim slovima, a naziv tabele treba da bude dat u sledećem redu, *kurzivom*. Broj i naziv tabele nalaze se iznad tabele, poravnati u levo. Tabele ne smeju da sadrže vertikalne linije. Redovi tabele ne treba da budu razdvojeni linijama, ali zaglavlje tabele mora da bude linijom odvojeno od ostalih redova.

Vrednosti u tabelama bi trebale da budu date u sredini kolone, sa decimalnim mestima pozicioniranim levim tabulatorom.

Korektan prikaz tabele:

Tabela 1
Korelacije nasilnog ponašanja i osobina ličnosti

EPQ-R	Nasilno ponašanje		
	Fizičko nasilje	Verbalno nasilje	Relaciono nasilje
Neuroticizam	.23	.26	.12
Ekstraverzija	.18	.25	.36
Psihoticizam	.45	.33	.39

Nekorektan prikaz tabele:

Tabela 1: ***Korelacije nasilnog ponašanja i osobina ličnosti***

EPQ-R		Nasilno ponašanje	
	Fizičko nasilje	Verbalno nasilje	Relaciono nasilje
Neuroticizam	0.236	0.261	0.122
Ekstraverzija	0.187	0.255	0.361
Psihoticizam	0.454	0.336	0.397

Grafikoni i slike. Slike treba slati u elektronskoj formi sa rezolucijom od najmanje 300 dpi. Štampa časopisa je crno-bela, pa se autori mole da prilagode tabele, grafikone i slike crno-beloj štampi. Ukoliko se koristi ilustracija iz štampanog izvora nužno je pismeno odobrenje vlasnika autorskih prava. Naziv slike treba da bude prikazan ispod slike nakon oznake rednog broja. Na primer:

*Slika 1***.** Schwartzov model univerzalnih ljudskih vrednosti

Rezultati statističke obrade. Rezultati statističkih testova treba da budu dati u sledećem obliku: $F(1, 9) = 25.35$, $p < .001$ i slično za druge testove (npr. $\chi^2(5, N = 454) = 5.311$, $p > .10$ ili $t(452) = 2.06$, $p < .05$). Treba navoditi manji broj konvencionalnih p nivoa (.05, .01 ili .001). Ukoliko je broj teorijski manji od 1 (npr. α, r, opterećenja u faktorskoj analizi, p nivo i sl.), nula se ne stavlja ispred tačke. Po pravilu, nazivi statističkih testova i oznaka treba da budu napisani u *kurzivu*, sem ako je reč o grčkim simbolima koji se **ne pišu** u kurzivu.

Decimalni brojevi. Uvažavajući statističke konvencije, decimalne brojeve treba pisati sa tačkom. Sve decimalne zapise treba zaokružiti na dve decimale, sem

kada se navode indikatori fita, *p* nivo značajnosti i sl. gde je i podatak o razlikama na trećoj decimali bitan.

Navođenje referenci u tekstu. Imena stranih autora navode se u originalu, npr. Dimanche (1990), ili kada je potrebno u padežnom obliku „...rezultati Dimanchea (Dimanche, 1990)...", s tim što je onda potrebno u zagradu staviti referencu.

Ukoliko referenca ima **dva autora**, oba se navode u tekstu, npr. (Costa & McCrae, 1992). Ukoliko je u pitanju domaća referenca, umesto znaka „&" navodi se „i", npr. (Jovanović i Petrović, 2011).

Ukoliko rad ima **3 do 5 autora**, u prvom navodu se pominju prezimena svih, a u kasnijim navodima samo prezime prvog autora i skraćenica „et al." za strane reference, ili „i sar." za domaće. Na primer, na engleskom jeziku, prvi navod bi imao formu (Roberts, Bogg, Walton, Chernyshenko, & Stark, 2004), a naredni (Roberts et al., 2004). Na srpskom jeziku, prvi navod bi imao formu (Novović, Biro i Nedimović, 2011), a naredni (Novović i sar., 2011).

Ukoliko dva rada iz iste godine imaju istog prvog autora, a ostali su različiti, treba navesti onoliko imena autora koliko je potrebno da bi se reference mogle jasno razlikovati u tekstu. Na primer, reference (Black, White, Brown, & Green, 1991) i (Black, Brown, White, & Green, 1991) imaju istog prvog autora i istu godinu izdanja. U ovom slučaju, u tekstu bi se navodile kao (Black, White, et al., 1991) i (Black, Brown, et al., 1991).

Ukoliko rad ima **šest ili više autora**, u tekstu se navodi samo prezime prvog i skraćenica „et al." ili „i sar.".

Spisak referenci. U spisku literature navode se samo reference na koje se autor pozvao u radu, abecednim redom po prezimenima autora. Ukoliko rad sadrži nekoliko referenci čiji je prvi autor isti, najpre se navode radovi u kojima je taj autor jedini autor, po rastućem redosledu godina izdanja, a potom se navode radovi u odnosu na abecedni red prvog slova prezimena drugog autora (ukoliko ima koautore). Ukoliko se navodi više radova istog autora u jednoj godini, godine treba da budu označene slovima a, b, c, npr. (1995a), (1995b). Za svaku referencu u popisu literature potrebno je navesti i **DOI broj**, ukoliko je dostupan. Na stranici https://www.crossref.org/requestaccount/, nakon otvaranja svog naloga, možete pronaći DOI broj za većinu dostupnih članaka.

Monografija (knjiga). Bibliografska jedinica knjige treba da sadrži prezime i inicijale autora, godinu izdanja, naslov knjige (*kurzivom*), mesto izdanja i izdavača, odnosno:

Pantić, D. (1990). *Promene vrednosnih orijentacija mladih u Srbiji.* Beograd: Institut društvenih nauka.

Nazivi knjiga na engleskom jeziku pišu se u „rečeničnom" formatu, takođe u *kurzivu*. Ukoliko naziv knjige ima podnaslov, on može počinjati velikim slovom.

Zbornik u celini. Ukoliko se kao referenca navodi zbornik radova u celini, referenca ima sledeću formu:

Biro, M., Smederevac, S. i Novović, Z. (Ur.) (2010). *Procena psiholoških i psihopatoloških fenomena.* Beograd: Centar za primenjenu psihologiju.

Poglavlje u knjizi ili zborniku navodi se na sledeći način:

Day, R. L. (1988). Measuring preferences. In R. Ferber (Ed.), *Handbook of marketing reasearch* (pp. 112-189). New York: McGraw-Hill.

Naslovi stranih knjiga i zbornika treba da budu dati u „rečeničnoj formi", sa početnim velikim slovom i ostalim malim. Ukoliko rad ima podnaslov, on se od naslova odvaja sa dve tačke i počinje velikim slovom. Ukoliko zbornik ima samo jednog urednika, umesto Eds. se navodi oblik jednine Ed. U domaćim referencama ovog tipa, strana skraćenica Ed. ili Eds. treba da glasi „Ur.", a „In" - „U".

Članak u časopisu treba da sadrži prezimena i inicijale autora, godinu izdanja u zagradi, naslov članka, puno ime časopisa (*kurzivom*), volumen (*kurzivom*) i stranice, odnosno:

Jovanović, V. (2010). Validacija kratke skale subjektivnog blagostanja. *Primenjena psihologija*, *3*(2), 175-190.

Dweck, C. S., & John, A. T. (1986). Motivational processes affecting learning. *American Psychologist, 41*, 1040-1048.

Nazivi članaka pišu se u „rečeničnom" formatu, u kom je samo prvo početno slovo veliko. Nazivi časopisa na engleskom jeziku pišu se tako da početna slova svih reči, izuzev veznika, budu velika. Nakon prezimena autora, uvek se stavlja zarez, kao i nakon inicijala (ukoliko ima više inicijala imena, zarez se stavlja nakon svih inicijala zajedno, a ne nakon svakog posebno). U domaćim referencama, znak „&" treba zameniti veznikom „i". Ukoliko se svi brojevi časopisa u okviru jednog volumena paginiraju sukcesivno, **ne treba** navoditi broj časopisa. Ukoliko se svaki broj časopisa u okviru volumena paginira odvojeno, referenca treba da sadrži i broj časopisa, pa izgleda ovako:

Dweck, C. S., & John, A. T. (1986). Motivational processes affecting learning. *American Psychologist, 41*(2), 26-37.

Referenca rada objavljenog u časopisu koji se izdaje isključivo u elektronskoj formi ima iste elemente kao referenca rada iz štampanog časopisa, ali se nakon broja stranica navodi „Retrieved from“ (za domaće reference „Preuzeto sa“) i web adresa:

Sillick, T. J., & Schutte, N. S. (2006). Emotional intelligence and self-esteem mediate between perceived early parental love and adult happiness. *E-Journal of Applied Psychology, 2*(2), 38-48. Retrieved from http://ojs.lib.swin.edu.au/index.php/ejap

Kada je reč o **web dokumentu ili stranici**, navodi se ime autora, godina, naziv dokumenta (*kurzivom*), datum kada je sajt posećen, i internet adresa sajta, npr.

Degelman, D. (2000). *APA Style Essentials.* Retrieved May 18, 2000 from: http://www.vanguard.edu/psychology/apa.pdf

Navođenje **nepublikovanih radova** (npr. rezimea sa naučnog skupa, manuskripta i sl.) nije poželjno. Ukoliko je takvo navođenje neophodno, treba navesti što potpunije podatke, kao u sledećem primeru:

Smederevac, S. (2000). *Istraživanje faktorske strukture ličnosti na osnovu leksičkih opisa ličnosti u srpskom jeziku* (Nepublikovana doktorska disertacija). Filozofski fakultet, Univerzitet u Novom Sadu, Novi Sad.

Prevod referenci. Ukoliko se na recenziju predaje rad na engleskom jeziku i pri tome se citiraju reference na srpskom, potrebno je dati engleski prevod citiranih naslova u uglastim zagradama:

Padejski, N., & Biro, M. (2014). Faktori vulnerabilnosti za postraumatski stresni poremećaj kod žrtava partnerskog nasilja [Vulnerability factors for posttraumatic stress disorder in victims of intimate partner violence]. *Primenjena psihologija, 7,* 63-85.

Prilog. U priloge treba staviti samo one opise materijala koji bi bili korisni čitaocima za razumevanje, evaluiranje ili ponavljanje istraživanja.

Fusnote i skraćenice. Fusnote treba izbegavati. Skraćenice takođe treba izbegavati, osim izrazito uobičajenih. Skraćenice koje su navedene u tabelama i slikama treba da budu objašnjene. Objašnjenja (legenda) se daju ispod tabele ili slike.

PRIMENJENA PSIHOLOGIJA