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Comparison of lexical-semantic processing in children with developmental language disorder and typically developing peers

Summary

Recent studies indicate that lexical and semantic deficits in children with developmental language disorder (DLD) are not caused only by reduced vocabulary and retrieval difficulties but also by sparse lexical-semantic network and deficits in semantic organization. This paper investigates qualitative differences in the lexical processing between children with DLD and typically developing peers, as well as developmental trends in the lexical-semantic processing in preschool and early school-age children with DLD. The sample consisted of 115 participants (5–8 yr.), 60 children with DLD and 55 typically developing (TD) children. The sample was also divided in two age groups, preschool (5 and 6 yr.) and school-aged groups (7 and 8 yr.). Word association task was used for the assessment of lexical-semantic processing. The responses were coded either as mature associations (paradigmatic and syntagmatic), immature associations (phonological, unrelated and echolalic) or omissions. The results show that DLD children have significantly less mature associations and more immature associations. Also, the performance of children with DLD was significantly poorer at early school age compared to their TD peers. Sparse lexical-semantic network and deficits of semantic organization in DLD children are caused by poor semantic fields and semantic categories, as well as difficulties in the activation of lexicon. However, developmental trends analysis showed that DLD children, although significantly delayed in lexical processing, have similar developmental pattern like TD children.

Key words: developmental language disorder, lexical-semantic processing, developmental trend

1. INTRODUCTION

1.1. Lexical-semantic deficits in children with developmental language disorder

Delays in early word acquisition are one of the first symptoms of lexical-semantic deficits in children with developmental language disorder (DLD) (La Paro, Justice, Skibbe, & Pianta, 2004; Rice, Taylor, & Zubrick, 2008). Some authors consider this to be the key symptom of delay in the speech and language development in children who are later diagnosed with DLD (Bishop, 2014; Watkins, Kelly, Harbers, & Hollis, 1995). Studies have repeatedly shown that DLD children have significant deficits in lexical semantics. These children have been reported to have reduced receptive and expressive vocabularies compared to their typically developing peers (Gray, Plante, Vance, & Henrichsen, 1999; Vuković, I., & Vuković, M., 2007), as well as word finding difficulties in naming tasks and during spontaneous speech (Messer & Dockrell, 2006). Furthermore, novel words learning studies indicate that children with DLD have poorer performance than age-matched controls (Gray, 2005; Nash & Donaldson, 2005). However, naming deficits in children with DLD are not only due to difficulties with long-term lexical memory retrieval, but these children also have underdeveloped semantic representations and deficits in lexical-semantic organization and processing (Dockrell, Messer, George, & Ralli, 2003; McGregor & Apel, 2002; Sheng & McGregor 2010).

In terms of lexical processing abilities, a developmental delay in children with DLD is well documented, where lexical processing can be adequate to child's vocabulary but not to the child's age (Pizzioli & Schelstraete, 2011). In addition, children with DLD give significantly poorer word definitions compared to typically developing peers (McGregor, Newman, Reilly, & Capone, 2002), and generally demonstrate significantly lower conceptual knowledge of words (Alt, M., Meyers, & Alt, P., 2013). Word association studies also gave insight into sparse semantic representations in DLD children. Sheng and McGregor (2010) found that more immature types of word associations are linked to poor lexical-semantic organization in children with DLD. In this study, DLD children also provided less semantic responses and more errors comparing to both, age-matched and vocabulary matched children. These data showed that children with DLD had deficits in lexical processing that exceeded their overall vocabulary delays. In addition, the results of some studies showed that deficits in lexical processing continued through school-age period in children with DLD (Mainela-Arnold, Evans, & Coady, 2010).

1.2. Lexical-semantic network

The term "lexical-semantic network" refers to a theoretical concept which includes person's vocabulary, the way words are stored in semantic memory and how they are organized, as well as processes that allow access to semantic memory (Collins & Loftus, 1975). According to Spreading-activation theory described by Collins and Loftus, the semantic system consists of conceptual nodes. The conceptual nodes that share semantic information are connected to each other, therefore, the activation of one node triggers the activation of whole network of semantically connected nodes. For example, the word *leg* may readily activate words such as *arm*, *head*, *shoulder*, *leg* or other, all of which belong to the same semantic category as *leg*. Words that share some semantic features with *leg*, such as *shoes*, *walk*, *kick*, can also be activated. Which word will be activated by stimulation of conceptual node depends on the strength of activation. Growing number of semantic features provides wider and more stable activation of the lexical-semantic network (Patterson, Nestor, & Rogers, 2007). Accordingly, poor lexical concepts (small number of semantic information) and poor semantic categories (small number of words in semantic category) can lead to weaker activation of lexical-semantic network.

In term of evaluation lexical-semantic knowledge, lexicon is often described in the context of "breadth" and "depth." Although it is difficult to isolate the assessment of these two lexicon dimensions (Vermeer, 2001), lexicon "breadth" is often measured by the number of words that a person has, for example, with confrontational naming tasks (picture naming) (McGregor et al., 2012). On the other hand, the lexicon "depth" is more difficult to evaluate, and is usually assessed with word definitions, lexical ambiguity resolution, synonyms or word associations tasks (Boucher, Bigham, Mayes, & Muskett, 2008; McGregor et al., 2012; Norbury, 2005). Thus, these types of tasks measure richness with which a given word is represented and how words are organized among each other in one's lexicon (McGregor et al., 2012).

1.3. Current study

Guided by semantic network model (Collins & Loftus, 1975), the current study is set to investigate qualitative differences in the lexical processing between children with DLD and typically developing peers. Preschool and early school period is characterized by dynamic development of lexical skills. Furthermore, in this short period of time a child has to master a high number of skills necessary for acquiring the curriculum. Thus, linguistic deficits in DLD children can increase during this

period of development. Accordingly, the aim of this study was to investigate the developmental trends in the lexical-semantic processing in preschool and early school children with DLD.

Relating to linguistic profile of DLD children, there is debate among researchers whether DLD is a disorder which is manifesting as delayed versus deviant development of language abilities. Although the unusual linguistic patterns are sometimes seen in children with DLD, specifically in area of phonological and morphosyntactic abilities, it is shown that the observed "deviant" patterns are not typical for these children (Leonard, 2000). Regarding this delay – deviance dichotomy, we also wanted to investigate whether children with DLD, aged five to eight, show any atypical pattern in the development of lexical-semantic abilities. Further, immature association types were neither investigated nor explained in detail in previous studies. Studies in this research field were mostly focused on mature type of associations (paradigmatic and syntagmatic) in a context of semantic abilities (Sheng & McGregor, 2010), but also in a context of syntactic abilities (McGregor et al., 2012). Considering that, we also wanted to investigate the hierarchy of immature types of associations in DLD children compared to TD children to gain full insight of developmental pattern.

2. METHODS

2.1. Participants

The sample consisted of 115 participants aged between five to eight years comprised in two groups: a group of children with DLD and a group of typically developing (TD) children. The children with DLD were recruited from the local speech and language therapy services in Belgrade, Serbia. The control children were recruited from local preschools and schools in Belgrade as well.

The DLD group included 60 children aged between 58 and 100 months, mean age 73 months. There were 38 boys and 22 girls in this group. *Wechsler intelligence scale for children revised* that has been normed on the Serbian population (Biro, 1997) was administered to all children. Inclusion criterion was IQ above 85. All 60 children were diagnosed with expressive type of DLD. Type of speech and language disorders was diagnosed by qualified speech and language therapist who administered the following series of test tasks: 1. Global articulation test (Kostić & Vladislavljević, 1983) (below 75% of age expected performance); 2. Phoneme discrimination test (Kostić,

Vladisavljević, & Popović, 1983) (below 75% of age expected performance); 3. Children's grammar (Vladisavljević, 1983a) (below 50% of age expected performance); 4. Semantic test (Vladisavljević, 1983b) (below 50% of age expected performance) and 5. Understanding and comprehension of speech test (Vladisavljević, 1997) (min 75% of age expected performance). The assessment tasks 1 to 5 are not standardized.

The control group included 55 TD children aged between 60 and 100 months, mean age 73 months. There were 27 boys and 28 girls. All 55 children passed preschool speech and language screening in referential institutions in Belgrade. TD group was age matched to DLD group and there were no statistically significant differences between the two groups regarding age ($F_{(1)} = 0.665$; $p = 0.416$), sex ($\chi^2_{(1)} = 2.369$; $p = 0.124$) and mother's education ($\chi^2_{(1)} = 0.81$; $p = 0,783$).

Furthermore, the sample was divided into two age sub-groups: 1. preschool children (5 and 6 yr.) including 33 DLD and 25 TD children; 2. School-aged children (7 and 8 yr.) including 27 DLD and 30 TD children.

2.2. Materials

Word association task (WAT) was used to examine the lexical processing skills in children. For the purposes of this study we took 80 words from Kent-Rosanof list (Kent & Rosanoff, 1910) and added 10 verbs. The final list of words consisted of 90 items (50 nouns, 14 verbs and 26 adjectives). All words selected were early acquired, highly imaginable, of course depending on the word class, with either high or medium frequency, according to *Children's frequency dictionary* (Lukić, 1983).

Association responses were coded into six categories: paradigmatic, syntagmatic, phonological, unrelated, echolalic and omissions (no response). *Paradigmatic* responses were those that had a clear semantic relation to a stimulus word, for example, synonyms, antonyms, hypernyms or words from same semantic category. *Syntagmatic* responses were those that had a clear sequential connection with the stimulus words (book – reading) or words derived from stimulus word. *Phonological* responses were those words that are phonologically similar but bare no semantic relation to the stimulus word, for example, *crn* – *trn* (black – thorn). *Unrelated* responses were those that show neither one of above mentioned relationship with the stimulus word. *Echolalic* responses were repetitions of the stimulus word.

Code reliability. To check for reliability of coding, a second coder independently coded 20% of samples from each group, not familiar to the identity of the children.

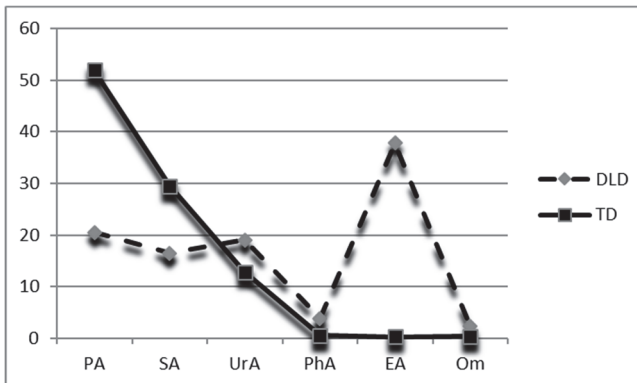
Point-to-point agreement averaged 93%. The remaining responses were coded by the author after the agreement was established.

Statistical analysis. Chi-square test and analysis of variance (ANOVA) were used for comparing two groups of children on age, sex and mother's education. Differences between two groups regarding their lexical processing skills were investigated using an ANOVA. When the assumption of homogeneity of variances has been violated, Welch ANOVA was used. Furthermore, Pearson's correlations were used in order to examine the correlation pattern of associations in the two groups of children. Two-way ANOVA was used to investigate the developmental trends in lexical processing in the two groups.

3. RESULTS

3.1. Mature and immature associations in DLD and TD children

The distribution of WAT answers is shown in Figure 1.



Legend / Legenda: DLD – developmental language disorder / *razvojni jezični poremećaj*; TD – typically developing children / *djeca urednog razvoja*; PA – paradigmatic associations / *paradigmatske asocijacije*; SA – syntagmatic associations / *sintagmatske asocijacije*; UrA – unrelated associations / *nepovezane asocijacije*; PhA – phonological associations / *fonološke asocijacije*; EA – echolalic responses / *eholalije*; Om – omissions / *omisijske*

Figure 1. Associations in DLD and TD children

Slika 1. Asocijacije kod djece s razvojnim jezičnim poremećajem i djece urednog razvoja

Regarding the between groups differences in number of mature associations (paradigmatic and syntagmatic), children with DLD showed significantly poorer performance compared to their TD peers. On the other hand, children with DLD produced significantly more echolalic responses. Also, DLD children did not give any response to a stimulus word significantly more. Children with DLD and TD children did not differ significantly regarding the number of unrelated and phonological responses (Table 1).

Table 1. ANOVA test for comparison of two groups regarding WAT responses
Tablica 1. ANOVA test usporedbe dviju skupina na Testu asocijacija riječi

		Mean / Aritmetička sredina	SD	<i>F</i>	<i>p</i>
Paradigmatic / Paradigmatski	DLD	20.518	23.295	65.229	0.000
	TD	51.940	18.305		
Syntagmatic / Sintagmatski	DLD	16.482	15.491	20.236	0.000
	TD	29.516	15.554		
Unrelated / Nepovezani	DLD	19.055	19.986	0.323	0.571
	TD	17.292	12.779		
Phonological / Fonološki	DLD	3.814	14.643	2.981	0.089
	TD	0.545	0.824		
Echolalic / Eholalije	DLD	37.833	44.721	42.238	0.000
	TD	0.303	0.918		
Omission / Omisije	DLD	2.277	4.924	7.685	0.007
	TD	0.404	1.702		

Statistically significant differences are bolded. / Statistički značajne razlike su podebljane.

3.2. Intercorrelations of WAT responses in DLD and TD children

Correlation analyses were run separately for the two groups. The results were different for the groups. In the TD group the results for unrelated and syntagmatic associations seem to be significantly opposite to the most mature, paradigmatic associations (Table 2). This means that the participants who had more paradigmatic responses also had fewer syntagmatic responses, as well as fewer unrelated associations. Further, the TD children who had less phonological associations also had less echolalic responses and children who had fewer omissions also gave less echolalic responses.

Table 2. Correlations between associations types in the TD group**Tablica 2.** Korelacije između vrsta asocijacija kod djece urednog razvoja

		Omission / Omisijske	Echolalic / Eholalije	Phonological / Fonološki	Unrelated / Nepovezani	Syntagmatic / Sintagmatski
Paradigmatic /	<i>r</i>	-0.145	-0.136	-0.023	-0.525	-0.720
Paradigmatski	<i>p</i>	0.290	0.321	0.868	0.000**	0.000**
Syntagmatic /	<i>r</i>	-0.012	0.068	0.058	-0.193	
Sintagmatski	<i>p</i>	0.929	0.622	0.672	0.159	
Unrelated /	<i>r</i>	0.032	-0.075	-0.183		
Nepovezani	<i>p</i>	0.814	0.587	0.182		
Phonological /	<i>r</i>	0.263	0.623			
Fonološki	<i>p</i>	0.052	0.000**			
Echolalic /	<i>r</i>	0.563				
Eholalije	<i>p</i>	0.000**				

** $p < 0.01$; * $p < 0.05$

Table 3. Correlations between associations in the DLD group**Tablica 3.** Korelacije između vrsta asocijacija kod djece s razvojnim jezičnim poremećajem

		Omission / Omisijske	Echolalic / Eholalije	Phonological / Fonološki	Unrelated / Nepovezani	Syntagmatic / Sintagmatski
Paradigmatic /	<i>r</i>	0.189	-0.691	-0.136	0.128	0.396
Paradigmatski	<i>p</i>	0.148	0.000**	0.301	0.330	0.002**
Syntagmatic /	<i>r</i>	0.123	-0.717	-0.100	0.411	
Sintagmatski	<i>p</i>	0.350	0.000**	0.448	0.001**	
Unrelated /	<i>r</i>	0.198	-0.661	-0.051		
Nepovezani	<i>p</i>	0.128	0.000**	0.701		
Phonological /	<i>r</i>	-0.080	-0.191			
Fonološki	<i>p</i>	0.541	0.145			
Echolalic /	<i>r</i>	-0.313				
Eholalije	<i>p</i>	0.015**				

** $p < 0.01$; * $p < 0.05$

Correlation analysis indicates a different pattern of associations in DLD children (Table 3). The results for the echolalic responses show opposite values to the most mature ones – the paradigmatic associations, and they have reached statistical significance. The correlation is negative and very high. The same type of correlation was found between syntagmatic and echolalic responses as well. This means that the DLD children who had more paradigmatic and syntagmatic associations had fewer echolalic responses. Furthermore, the positive correlation was observed between syntagmatic and unrelated responses. Unlike the results from the control group, there was no significant correlation between paradigmatic and syntagmatic associations in the DLD group.

Correlation analysis between immature types of associations (phonological, unrelated, omissions and echolalic) showed a high negative correlation between unrelated and echolalic responses, as well as a moderate negative correlation between the echolalic responses and omissions. These results indicate that DLD children who had more unrelated associations and more omissions had significantly less echolalic responses.

3.3. Developmental trend of association skills in DLD and TD children

Further analysis was performed in order to compare the developmental trends of associations in two groups. Using two-way ANOVA, the interaction of language status and age was not determined regarding the number of the paradigmatic associations ($F_{(1;111)} = 0.674$; $p = 0.414$). This means that the number of paradigmatic associations increases with age and the increase was statistically significant in both groups (DLD: Welch $F_{(1;39.870)} = 11.309$, $p = 0.002$; TD: $F_{(1;111)} = 8.550$, $p = 0.005$). A similar pattern was also observed regarding the number of syntagmatic associations ($F_{(1;111)} = 0.816$; $p = 0.368$). The number of syntagmatic responses also increase with age in both groups, but in this case it was not statistically significant in any group (DLD: $F_{(1;111)} = 2.666$, $p = 0.108$; TD: $F_{(1;111)} = 0.084$, $p = 0.773$).

In the case of unrelated associations interaction of language status and age was present ($F_{(1;111)} = 10.004$; $p = 0.002$) (Figure 2). In children with DLD, the number of unrelated responses increases with age and in TD children decreases. Developmental changes that were observed in children with DLD are not statistically significant ($F_{(1;111)} = 1.407$; $p = 0.240$), in contrast to those that were detected in TD children ($F_{(1;111)} = 19.523$; $p \leq 0.000$).

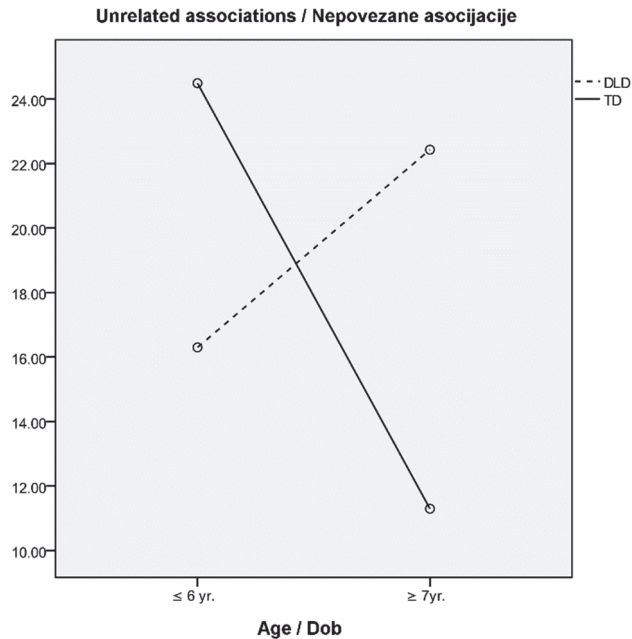


Figure 2. Unrelated associations – age related changes in DLD and TD children
Slika 2. Nepovezane asocijacije – dobne promjene kod djece s razvojnim jezičnim poremećajem i djece tipičnog razvoja

Regarding phonological associations, the interaction of language status and age was not determined ($F_{(1;111)} = 2.461$; $p = 0.120$). However, the analysis of mean values indicated a different pattern in both groups. In DLD group the number of phonological responses increased with age (mean = 1.18; SD = 2.22 vs. mean = 7.04; SD = 21.47), while in TD group decreased (mean = 0.71; SD = 1.01 vs. mean = 0.41; SD = 0.62). Nevertheless, the observed differences were not statistically significant (DLD: Welch $F_{(1; 26.456)} = 1.994$, $p = 0.170$; TD: Welch $F_{(1; 38.270)} = 1.728$, $p = 0.197$). Similar pattern was also observed regarding omissions ($F_{(1;111)} = 1.833$; $p = 0.179$). Like in a case of phonological associations, the number of omissions decreased with age in TD children (mean = 0.84; SD = 2.47 vs. mean = 0.04; SD = 0.20) while that number increased in DLD children (mean = 1.78; SD = 3.78 vs. mean = 2.88; SD = 6.06). However, this developmental trend was not statistically significant (TD: Welch $F_{(1;24.270)} = 2.656$, $p = 0.116$; DLD: Welch $F_{(1;41.715)} = 0.670$, $p = 0.418$).

Regarding echolalic responses, the interaction of language status and age was determined ($F_{(1; 111)} = 12.317$; $p = 0.001$) (Figure 3). The number of echolalic

responses in TD children, regardless of age, was very small, and was reduced to almost insignificant level (mean = 0.58, SD = 1.29 vs. mean = 0.07, SD = 0.28; Welch $F_{(1; 25.921)} = 3.678$; $p = 0.066$) at school-age. On the other hand, age-related differences in the number of echolalic responses were much more evident in DLD children. The number of echolalic responses significantly dropped at school age (mean = 55.42, SD = 45.30 vs. mean = 16.34, SD = 33.77; Welch $F_{(1; 57.555)} = 14.629$; $p \leq 0.000$).

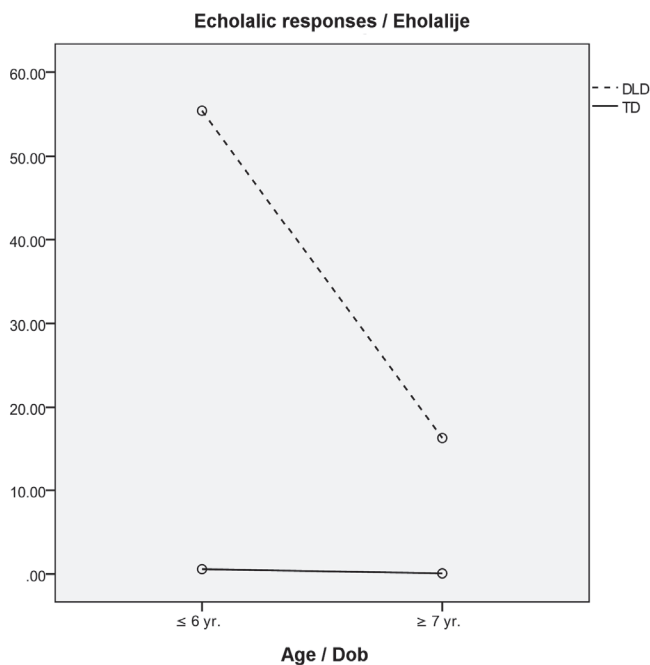


Figure 3. Echolalic responses – age related changes in DLD and TD children

Slika 3. Eholalije – dobne promjene kod djece s razvojnim jezičnim poremećajem i djece urednog razvoja

4. DISCUSSION

4.1. Lexical-semantic processing in DLD and TD children

Comparing DLD children and their TD peers, significant differences in the number of paradigmatic, syntagmatic and echolalic associations were observed. Children with DLD had significantly fewer paradigmatic and syntagmatic associations and significantly more echolalic responses and omissions. These results indicate a deficit

in the lexical-semantic processing in children with DLD. According to Spreading-activation theory (Collins & Loftus, 1975), stimulus word activates whole network of semantically connected words. Which association will be activated depends on the access to the lexicon and semantic richness of particular conceptual field (semantic features and connotative meanings), as well as on the strength of semantic network (number of links connecting conceptual nodes). Paradigmatic associations indicate semantically rich conceptual fields, as well as strong links within semantic network. On the other hand, the repetition of the stimulus word (echolalic responses), depending on the age, may indicate a deficit in the lexical and semantic processing, or deficits in access to the lexicon.

These findings confirmed that children with DLD have deficits in lexical-semantic organization. Furthermore, our results are consistent with the existing studies demonstrating deficits in semantic learning (Alt & Plante, 2006; Alt, Plante, & Creusere, 2004; Gray, 2005; Nash & Donaldson, 2005) and deficits in semantic processing (Dockrell et al., 2003; McGregor & Appel, 2002; McGregor et al., 2012; McGregor et al., 2002).

Sheng and McGregor (2010) also used word association task (specifically *repeated word association task*) in order to compare lexical-semantic processing in DLD children with typically developing children who were matched to the DLD group on chronological age and typically developing children who were matched to the DLD group on expressive vocabulary. The results of this study also showed that children with DLD had significantly fewer semantic association, as well as significantly more immature associations (phonological and other error responses), comparing to their typically developing peers. Similarly, children with DLD had significantly poorer performance comparing to expressive vocabulary matched TD children. Based on these findings, the authors concluded that children with DLD have deficits in lexical-semantic processing that exceeds vocabulary deficits in these children.

The correlations analysis indicated different patterns of associations in DLD children and TD peers. While typically developing children shifting from syntagmatic to paradigmatic association (significant negative correlation of paradigmatic and syntagmatic responses), children with DLD are still shifting between immature types of associations (significant negative correlation between unrelated and echolalic responses, as well as between omissions and echolalic responses). Namely, it is possible that echolalic responses represent the most immature type of associations because the child is unable to access the lexical-semantic system, or to process a stimulus word in

any other way, so it only repeats the word (Cronin, 2002). Although there is no detailed analysis of immature types of associations in previous studies, the echolalic responses were usually classified as the last and most infrequent type of errors in children with DLD (McGregor et al., 2012; Sheng & McGregor, 2010). Further, the qualitative analysis of individual samples of DLD children in our study showed that a large number of unrelated associations were related to improper use of grammatical morphemes with stimulus word (e.g. negative prefixes + stimulus word – *tvrdl netvrd*). It is possible that children learned certain morphosyntactic rules but still lack in proper use, so when they are not able to semantically process the stimulus word they apply these learned rules and make an inadequate compound words. In the case where a child made an adequate compound word, which exists in lexical corpus of Serbian language (e.g. *miran/nemiran*), it was considered as a mature type of association. On the other hand, if a child gave an answer consisting of negative prefixes + real word, making a compound word which does not exist in lexical corpus of Serbian language, like in the case of *netvrd*, that was considered the immature type of association (real antonym of *tvrd* is *mekan*). This type of unrelated associations can indicate not only deficits in lexical processing, but also morpho-syntactic deficits. Also, a large number of unrelated associations can occur because a child does not have stimulus word in his/her vocabulary. As a result, the child can name an object in the surrounding or randomly selected word (Sheng & McGregor, 2010). Therefore, it is possible that in the hierarchy of associations, unrelated responses, although belonging to the immature type of associations, are more mature responses than echolalic ones.

Regarding omissions, it is possible that a child cannot access the lexical-semantic network or does not have the stimulus word in vocabulary. We considered omissions as more mature compared to echolalic responses. Observed negative correlation between omissions and echolalic responses in children with DLD, partially confirmed this. Also, in DLD children, omissions positively correlated with more mature types of associations, such as paradigmatic and syntagmatic, although correlations were not statistically significant. In DLD lexical processing studies we did not find same associations coding as one used in our study, however, Gewirth, Shindler, and Hier (1984) used similar coding in a study of semantic processing of people with aphasia and dementia. Results of their study showed that echolalic responses are the most frequent in people with Wernicke's aphasia while omissions were most frequent in people with Broca's aphasia. Moreover, patients with Broca's aphasia had significantly more paradigmatic associations comparing to patients with Wernicke's aphasia.

Whereas Wernicke's aphasia is characterized by severe deficits in semantic organization, while people with Broca's aphasia have more difficulties in accessing lexicon than in semantic organization (Vuković, 2011), we can assume that echolalic responses indicate more severe deficit of semantic processing.

4.2. Developmental trend of association skills in DLD and TD children

Comparing the development trend in DLD and TD children, some differences were noted. Regarding the most mature type of associations, the paradigmatic ones (McGregor et al., 2012), they increase significantly in both school-age groups. Also, the increase of syntagmatic associations was also noted in both groups although it was not statistically significant one. In the case of immature associations, some slightly different trends were observed. TD children showed decrease of immature associations related to age, but only unrelated associations have reached statistical significance. On the other hand, in DLD children the number of immature associations (phonological, unrelated, and omissions) slightly increased but did not reach statistical significance. However, the number of echolalic responses significantly decreases with age in DLD group. Still, school-age children with DLD had significantly less mature types of associations and more immature ones comparing to their TD peers.

These results indicate that children with DLD have significant difficulties in lexical-semantic processing even at early school age. These children do improve significantly with age but the delay in semantic organization skills is still considerable. While early school period is characterized by syntagmatic – paradigmatic shift (Cronin, 2002), children with DLD are still at a level of immature associations shift. This indicates that school-age children with DLD have poor lexical concepts and weak activation of the lexical-semantic network.

These findings are consistent with previous studies demonstrating lexical-semantic deficits in school-age children with DLD (Mainela-Arnold et al., 2010; Marinellie & Johnson, 2002).

Comparing the developmental changes in DLD and TD children, aged from five to eight, we can say that children with DLD have very immature organization of lexical-semantic network. However, these children follow a similar developmental trend as typically developing children. Other studies have showed that, regarding lexical-semantic abilities, children with DLD do not exhibit a significantly different developmental pattern comparing to typically developing peers (Alt et al., 2004; Gray, 2005; Marinellie & Johnson, 2002; McGregor et al., 2012).

5. CONCLUSION

The results of our study showed that children with DLD have deficit in the organization and development of the lexical-semantic network. Deficits are manifesting as sparse semantic fields, pure semantic categories, as well as difficulties in lexicon activation. However, children with DLD follow a similar developmental pattern as typically developed children, although they have significant deficits in the lexical-semantic processing at early school period.

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APPENDIX / PRILOG

List of chosen words for Word Association Task / Popis izabranih riječi za zadatak povezivanja riječi

- | | | |
|------------------------|----------------------------|--------------------------|
| 1. tepih / carpet | 31. devojčica / girl | 61. kvadrat / square |
| 2. mračan / dark | 32. visok / tall | 62. puter / butter |
| 3. muzika / music | 33. rad / work | 63. lekar / doctor |
| 4. bolest / illness | 34. kiseo / sour | 64. glasan / loud |
| 5. muškarac / man | 35. zemlja / land | 65. čitati / to read |
| 6. dubok / deep | 36. vojnik / soldier | 66. lav / lion |
| 7. mek / soft | 37. sedeti / to sit | 67. krevet / bed |
| 8. jelo / meal | 38. tvrd / hard | 68. težak / heavy |
| 9. plakati / to cry | 39. orao / eagle | 69. duvan / tobacco |
| 10. kuća / house | 40. stomak / belly | 70. beba / baby |
| 11. crn / black | 41. stabljika / stem | 71. ljubiti / to kiss |
| 12. ruka / arm | 42. sanjati / to dream | 72. makaze / scissors |
| 13. kratak / short | 43. žut / yellow | 73. miran / calm |
| 14. voće / fruit | 44. hleb / bread | 74. zelen / green |
| 15. leptir / butterfly | 45. dečak / boy | 75. so / salt |
| 16. stolica / chair | 46. svetlost / light | 76. ulica / street |
| 17. sladak / sweet | 47. ovca / sheep | 77. kralj / king |
| 18. žena / woman | 48. kupanje / bathing | 78. sir / cheese |
| 19. hladan / cold | 49. koliba / cottage | 79. cvetati / to blossom |
| 20. želeti / to want | 50. smejati / to laugh | 80. uplašen / frightened |
| 21. reka / river | 51. plav / blue | 81. leteti / to fly |
| 22. beo / white | 52. gladan / hungry | 82. mesec / moon |
| 23. lep / pretty | 53. glava / head | 83. lopov / thief |
| 24. prozor / window | 54. šporet / kitchen range | 84. guliti / to peel |
| 25. seći / to cut | 55. dugačak / long | 85. brdo / hill |
| 26. stopalo / foot | 56. dete / child | 86. brz / fast |
| 27. pauk / spider | 57. gorak / bitter | 87. kupus / cabbage |
| 28. igla / needle | 58. pevati / to sing | 88. čekić / hammer |
| 29. crven / red | 59. žedan / thirsty | 89. grub / rough |
| 30. spavati / to sleep | 60. grad / city | 90. hodati / to walk |

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Usporedba leksičko-semantičkog procesiranja djece s razvojnim jezičnim poremećajem i vršnjaka urednog razvoja

Sažetak

Novija istraživanja pokazuju da leksički i semantički deficit kod djece s razvojnim jezičnim poremećajem (engl. *developmental language disorder*, DLD) nije rezultat samo smanjenog vokabulara i poteškoća u prizivu, već je uzrokovan siromašnijom leksičko-semantičkom mrežom te lošijom semantičkom organizacijom. U ovom se radu istražuju kvalitativne razlike u leksičkom procesiranju između djece s DLD-om i vršnjaka urednog razvoja te razvojni trendovi u leksičko-semantičkom procesiranju kod predškolaca i djece rane školske dobi. U istraživanju je sudjelovalo 115 ispitanika u dobi od pet do osam godina, od kojih je 60 ispitanika bilo s DLD-om, dok je 55 pripadalo kontrolnoj skupini urednog razvoja (TD). Grupiranje uzorka prema dobi također obuhvaća dvije skupine; predškolci (u dobi od pet i šest godina) i školarci (sedam i osam godina). Za ispitivanje leksičko-semantičkog procesiranja korišten je zadatak povezivanja riječi. Odgovori su kodirani u tri kategorije: razvijene asocijacije (paradigmatske i sintagmatske), nerazvijene asocijacije (fonološke, nepovezane i eholalija) te omisija. Rezultati pokazuju da djeca s DLD-om imaju statistički značajno manje razvijenih asocijacija, a više nerazvijenih. Također, rezultati djece s DLD-om u ranoj školskoj dobi značajno su niži u usporedbi s vršnjacima urednog razvoja. Siromašna leksičko-semantička mreža i deficit u semantičkoj organizaciji kod djece s DLD-om uzrokovani su siromašnijim semantičkim poljima i kategorijama, jednako kao i poteškoćama tijekom aktivacije leksikona. Ipak, analiza razvojnih trendova pokazuje da djeca s DLD-om unatoč značajnom kašnjenju u leksičkom procesiranju pokazuju jednake razvojne obrasce kao i djeca urednog razvoja.

Ključne riječi: razvojni jezični poremećaj, leksičko-semantičko procesiranje, razvojni trend

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Hrvatska

Od fonemske raščlambe i stapanja do premetanja – nedostaci u fonološkoj svjesnosti u djece s poremećajem čitanja u hrvatskome

Sažetak

Fonološka svjesnost podupire ovladavanje čitanjem, a nedostaci u fonološkoj svjesnosti smatraju se jednim od osnovnih pokazatelja poremećaja čitanja. Povezanost fonološke svjesnosti i vještine čitanja razlikuje se u različitim ortografijama. Cilj je ovog istraživanja bio usporediti čitatelje s poremećajem čitanja i njihove vršnjake urednog razvoja u različitim zadacima fonološke svjesnosti te provjeriti koliko uspješno ovi zadaci razlikuju skupine; mjereći točnost, brzinu rješavanja zadatka te analizirajući uporabljene čestice. Dobiveni rezultati pokazuju da površinska ortografija hrvatskog podupire razvoj fonološke svjesnosti te su u većini zadataka obje skupine sudionika postigle visoku razinu točnosti. No, unatoč dosljednosti hrvatske ortografije, zadaci fonološke svjesnosti načelno uspješno razlikuju čitatelje s poremećajem čitanja i uredne čitatelje. Analiza čestica provedena u ovom istraživanju pokazuje da je neophodno uzeti u obzir posebnosti ortografije, fonološku duljinu i složenost čestica te čestotnost kako bi se povećala njihova osjetljivost u prepoznavanju čitatelja s poremećajem čitanja.

Ključne riječi: fonološka svjesnost, površinska ortografija, poremećaj čitanja

1. UVOD

Dobro razvijena fonološka svjesnost podupire ovladavanje čitanjem te je zajedno s radnim pamćenjem i brzim leksičkim prizivom najvažniji prediktor vještine čitanja (Landerl i sur., 2013; Moll i sur., 2014). S druge strane, nedostaci u fonološkoj svjesnosti jedan su od osnovnih nedostataka prisutnih kod poremećaja čitanja (Ramus, 2013). Ipak, povezanost fonološke svjesnosti i vještine čitanja ovisi o dobi u kojoj se ispituje, stupnju sustavne poduke u čitanju, leksičkim i fonološkim obilježjima uporabljenih čestica u zadacima te dubini ortografije jezika u kojem se pismenost ispituje. Sve je navedene sastavnice važno uzeti u obzir prije uporabe zadataka fonološke svjesnosti u kliničkoj praksi.

Fonološka svjesnost odnosi se na sposobnost prepoznavanja i baratanja jedinica manjim od riječi (slogovima i fonemima). Mnoga istraživanja pokazuju da su djeca s dobrom fonološkom svjesnosti tečni čitatelji, dok djeca s poremećajem čitanja pokazuju značajne teškoće u zadacima fonološke svjesnosti (Adams, 1990; Brady i Shankweiler, 2013; Swan i Goswami, 1997). Razvoj fonološke svjesnosti kreće od većih jedinica prema manjima (Anthony, Lonigan, Driscoll, Phillips i Burgess, 2003), završavajući sa svjesnošću o fonemima (fonemskom svjesnošću) koja se u potpunosti razvija tek kada započne sustavna poduka čitanja (Goswami i Bryant, 1990). Iako fonološka svjesnost omogućava ovladavanje čitanjem, samo čitanje podupire daljnji razvoj fonološke svjesnosti. Taj proces dodatno produbljuje razlike između dobrih i loših čitatelja (Perfetti, Beck, Bell i Hughes, 1987; Stanovich, 1986), ali i dovodi do bržeg nestajanja individualnih razlika u fonološkoj svjesnosti i slabijih korelacija između fonološke svjesnosti i čitanja u površinskim ortografijama (Ziegler i sur., 2010). U jezicima u kojima je povezivanje fonoloških i ortografskih jedinica izravno i jednoznačno, dekodiranje je brzo i jednostavno što posljedično dovodi do bržeg razvoja fonološke svjesnosti. Rezultati istraživanja u ovim jezicima (npr. turskom, finskom, grčkom, njemačkom) pokazuju da djeca na zadacima fonološke svjesnosti postižu najviše rezultate vrlo rano nakon početka sustavne poduke (Durgunoğlu i Öney, 1999; Holopainen, Ahonen i Lyytinen, 2002; Porpodas, 1999; Wimmer, Landerl, Linortner i Hummer, 1991). U skladu s tim, smatra se da fonološka svjesnost nije dobar pokazatelj mogućih teškoća čitanja u jezicima s površinskom ortografijom te da njezina povezanost s čitanjem u površinskim ortografijama slabi s dobi i sustavnom podukom čitanja (de Jong i van der Leij, 1999; Landerl i Wimmer, 2000).

Ipak, neka istraživanja pokazuju značajnu povezanost čitanja i fonološke svjesnosti u površinskim ortografijama i nakon dvije godine sustavne poduke (Caravolas, Volín i Hulme, 2005; Müller i Brady, 2001; Patel, Snowling i de Jong, 2004). Ovakvi oprečni rezultati istraživanja upućuju na velike razlike u osjetljivosti zadataka rabljenih za ispitivanje fonološke svjesnosti te na važnost razlika u ortografiji koje izravno i snažno utječu na zahtjevnost pojedinih zadataka u različitim jezicima. Utjecaj ortografije na zadatke fonološke svjesnosti najsustavnije su opisali Ziegler i Goswami (2005) u svojoj psiholingvističkoj teoriji veličine zrna (engl. *psycholinguistic grain size theory*). Prema ovoj teoriji čitatelji se na početku razvoja pismenosti susreću s tri problema koja proistječu iz dubine ortografije: problemom dostupnosti (engl. *availability*), dosljednosti (engl. *consistency*) i zrnatosti (engl. *granularity*). Problem dostupnosti odražava činjenicu da nisu sve fonološke jedinice svjesno dostupne prije početka ovladavanja čitanjem. Dakle, za uspostavljanje veze između ortografskih i fonoloških jedinica potreban je razvoj određenih kognitivnih i lingvističkih vještina. Još u prvim istraživanjima fonološke svjesnosti Liberman i Shankweiler su objasnili da je za razvoj fonološke svjesnosti nužan određen stupanj kognitivnog i jezičnog razvoja (Brady, 1997). Naime, ono što fonološku svjesnost čini zahtjevnom metajezičnom vještinom jest koartikulacija koja prikriva govorne jedinice: kako bi govor bio zadovoljavajuće brzine glasovi se u slogu međusobno preklapaju i stvaraju govornu struju u kojoj jedinice nisu lako razdvojive. Prije primjene alfabetskog načela i stvaranja fonološko-ortografskih povezivanja, potrebno je razdvojiti govornu struju na jedinice koje nisu uvijek dostupne. Konceptualno razumijevanje da se jezik sastoji od razdvojivih jedinica od kojih su najmanje fonemi, usko je povezano i s poznavanjem grafema, osobito u jezicima s površinskom ortografijom gdje se ove dvije vještine razvijaju usporedno (Aro, 2004). Dosljednost je obilježje koje razlikuje ortografije: ortografske jedinice mogu biti povezane s različitim izgovorom, odnosno fonološke predodžbe mogu imati različit ortografski zapis. Primjerice, hrvatska je ortografija dosljednija od engleske ortografije u kojoj jedan fonem može biti reprezentiran s više grafema ili nizova grafema, odnosno jedan grafem može biti povezan s različitim fonemima (npr. fonem [u] može biti reprezentiran kao "u" u *cube*, "ue" u *glue* ili "oo" u *school*). Problem zrnatosti odnosi se na činjenicu da je u jezicima u kojima je povezivanje fonološke i ortografske predodžbe temeljeno na većim osnovnim jedinicama (tj. zrnima, kako ih autori nazivaju), potrebno naučiti veći broj

ortografskih jedinica nego u jezicima u kojima je taj ulaz temeljen na manjim osnovnim jedinicama. Jezičnoj je produktivnosti svojstvena veća varijabilnost većih jezičnih jedinica. Dakle, riječi je više nego slogova, slogova je više nego mogućih pristupa ili odstupa sloga, dijelova sloga je više nego grafema. Zrnatost je veća u jezicima u kojima ulaz u fonološki sustav podrazumijeva uporabu većih osnovnih ortografskih jedinica (npr. slijed *sch* u njemačkom ili engleskom predstavlja jedan fonem, dok u hrvatskom jednom fonemu gotovo uvijek odgovara jedan grafem). Ziegler i Goswami (2005) na primjeru najčešće upotrebljavanog složenog zadatka fonološke svjesnosti – zadatku brisanja fonema zorno objašnjavaju utjecaj dubine ortografije na zahtjevnost zadatka: dok su u jezicima površinske ortografije ciljni fonemi uvijek ortografski reprezentirani, u jezicima kao što je engleski to ne mora biti slučaj, kao u primjeru brisanja četvrtog fonema u riječi *faxed* koje vodi do riječi *fact*. Zadaci u kojima povezivanje fonema i grafema nije jednoznačno zahtjevni su čak i za odrasle govornike engleskog. Suvremena hrvatska pravopisna norma opisuje se kao fonološko-morfološka, što podrazumijeva da hrvatski pravopis dominantno uzima u obzir fonološko načelo (pa se piše *slatka*, *otpuhati*, *iskopati*), ali u nekim slučajevima odabrano je morfološko načelo (npr. *predsjednik*) što dovodi do određenih nedosljednosti povezivanja fonema i grafema (Badurina, 2012). Iako je fonološka svjesnost zbog svoje uloge u predčitalačkom razdoblju često promatrana neovisno o ortografiji, ortografija utječe na povezanost fonološke svjesnosti i čitanja i potrebno ju je uzeti u obzir pri izradi zadataka fonološke svjesnosti.

Istraživanja pokazuju da zadaci fonološke svjesnosti i u površinskim ortografijama mogu biti razlikovni. Najčešće upotrebljavan (i prvi složeni zadatak fonološke svjesnosti prema Castlesu i Coltheartu, 2004) zadatak je brisanja fonema. Kao što je već objašnjeno, ovaj zadatak uvelike ovisi o dubini ortografije (Ziegler i Goswami, 2005), a de Jong i van der Leij (2003) su pokazali da zadatak brisanja može razlikovati čitatelje s poremećajem čitanja i uredne čitatelje i u jezicima površinske ortografije, ako je zadatak dovoljno složen. Osim brisanja, u površinskim ortografijama često su korišteni zahtjevniji zadaci, kao što je zadatak premetanja (Caravolas i sur., 2005; Landerl, Wimmer i Frith, 1997; Paulesu i sur., 2001). Neki autori uvode mjeru brzine kao dodatnu varijablu, pa su tako Patel i suradnici (2004) za usporedbu engleskih i nizozemskih govornika upotrijebili vremenski ograničeni zadatak brisanja (engl. *speeded deletion task*) kako bi osigurali podjednaku težinu

zadataka u obje ortografije, ali i izbjegli efekt stropa u površinskoj ortografiji. Vaessen, Gerretsen i Blomert (2009), osim točnosti, mjere i brzinu rješavanja zadatka, koja se pokazuje prediktivnom za brzinu čitanja.

Cilj je ovoga istraživanja usporediti čitatelje s poremećajem čitanja i njihove vršnjake urednog razvoja u različitim zadacima fonološke svjesnosti te provjeriti koliko uspješno ovi zadaci razlikuju skupine. U fokusu ovog istraživanja je pet zadataka fonološke svjesnosti: fonemska raščlamba i stapanje te brisanje, dodavanje i premetanje fonema, a uspješnost se promatra na dvije varijable: točnosti te vremenu potrebnom za rješavanje zadatka. Kako bi se provjerilo utječu li specifičnosti fonologije, ortografije te leksikona na uspješnost u rješavanju zadataka, čestice u zadacima su varirane po duljini, fonološkoj složenosti i čestotnosti te se u analizi čestica promatra kako se skupine razlikuju na pojedinim česticama zadatka.

S obzirom na rezultate istraživanja u drugim jezicima s površinskom ortografijom možemo pretpostaviti da točnost u jednostavnijim zadacima fonološke svjesnosti (raščlamba i stapanje) neće značajno razlikovati skupine, dok će se skupine razlikovati u točnosti u složenijim zadacima (brisanje, dodavanje, premetanje). Neki autori smatraju da i u zadacima u kojima točnost nije diskriminativna, brzina rješavanja može razlikovati skupine, stoga možemo pretpostaviti da će se i u ovom istraživanju skupine međusobno razlikovati na ovoj varijabli. U skladu s pretpostavkom teorije veličine zrna o utjecaju fonoloških obilježja i dubine ortografije na razvoj fonološke svjesnosti, očekuju se slabiji rezultati i veće razlike među skupinama u česticama fonološki složenije strukture te u onim česticama koje odstupaju od jednoznačnog povezivanja fonema i grafema.

2. METODA

2.1. Sudionici

U ovom je istraživanju sudjelovalo 77 sudionika podijeljenih u dvije skupine: uredni čitatelji (N = 52), čitatelji s poremećajem čitanja (N = 25). Dob sudionika bila je od 9;09 do 11;00 godina (Tablica 1.), pri čemu je raspon dobi bio jednak u obje skupine. Svi su sudionici polazili četvrti razred što znači da su jednako dugo formalno podučavani čitanju (3 godine i 6 do 9 mjeseci, ovisno o mjesecu ispitivanja). Roditelji sudionika pismeno su obaviješteni o postupku istraživanja te su potpisali obavijesni pristanak.

Tablica 1. Kronološka dob sudionika**Table 1.** Chronological age of the participants in the study

		Min. / Min	Maks. / Max	M	SD
Svi sudionici / All participants (N = 77)	Godine / Years	9,92	11,00	10,48	0,33
	Mjeseci / Months	119,00	132,00	125,79	4,00
Uredni čitatelji / Typical readers (N = 52)	Godine / Years	9,92	11,00	10,51	0,32
	Mjeseci / Months	119,00	132,00	126,12	3,79
Poremećaj čitanja / Dyslexia (N = 25)	Godine / Years	9,92	11,00	10,42	0,37
	Mjeseci / Months	119,00	132,00	125,08	4,43

Ispitivanje je provedeno tijekom proljeća 2015. Uzorak sudionika s poremećajem čitanja najvećim je dijelom prikupljen u Poliklinici za rehabilitaciju slušanja i govora SUVAG, Zagreb, zatim u Laboratoriju za psiholingvistička istraživanja Edukacijsko-rehabilitacijskog fakulteta te u logopedskom kabinetu "Logokor". Svi su sudionici imali dijagnozu poremećaja čitanja postavljenu na temelju kliničke procjene prema smjernicama iz DSM-IV: uz procjenu jezičnih sposobnosti te čitanja i pisanja. Kriterij je bio uredan sluh (provjeren audiometrijom) te uredan ili korigiran vid, izostanak epilepsije i drugih neuroloških stanja, uredan rezultat na testu za procjenu neverbalnih kognitivnih sposobnosti (Ravenove progresivne matrice; SR \geq 85). Djeca s dijagnozom poremećaja pažnje nisu uključena u istraživanje. Sva su djeca jednojezični govornici hrvatskog, polaznici redovnih osnovnih škola. Isključujući kriteriji zadovoljeni su i u skupini urednih čitatelja pri čemu je, zbog nemogućnosti provođenja audiometrije, podatak o urednom sluhu temeljen na novorođenačkom probiru.

2.2. Materijali, postupak i varijable istraživanja

U ovom je istraživanju upotrijebljeno pet zadataka fonološke svjesnosti: fonemska raščlamba, fonemsko stapanje, brisanje fonema, dodavanje fonema i premetanje¹. U svakom je zadatku mjerena točnost i vrijeme odgovora.

¹ Zadaci upotrijebljeni u ovom istraživanju razvijeni su za potrebe doktorskog rada, a podaci su prikupljeni u sklopu projekta Interdisciplinarni pristup razvoju jezično-kognitivnog modela disleksije kod odraslih (HR.3.2.01-0247) u okviru Strukturnih i investicijskih fondova Operativnog programa Razvoja ljudskih potencijala dodijeljenog Odsjeku za logopediju Edukacijsko-rehabilitacijskog fakulteta Sveučilišta u Zagrebu.

Zadatak fonemske raščlambe (Tablica 2.) uključivao je deset čestica različite duljine, fonološke složenosti te čestotnosti (prema Lukić, 1983). Čestice *ideja*, *stadion*, *anomalija* i *predsjednik* ispituju odstupanja od jednoznačne veze fonema i grafema koja je uobičajena u hrvatskoj ortografiji. Između dvaju vokala od kojih je barem jedan /i/ ili /e/ izgovara se kliznik /j/ koji ne mora uvijek biti naznačen i u ortografskoj reprezentaciji riječi (npr. *ideja*, ali *stadion*). Suglasničke skupine "ts" i "ds" izgovaraju se kao [c], npr. u *hrvatski* [hrvacki], ili *predsjednik* [precjednik]. Zadatak fonemskog stapanja uključivao je 11 čestica različite duljine, fonološke složenosti i čestotnosti (Tablica 2.).

Tablica 2. Čestice u zadacima fonološke raščlambe i fonološkog stapanja
Table 2. Items in the segmentation and the blending task

FONEMSKA RAŠČLAMBA / SEGMENTATION			FONEMSKO STAPANJE / BLENDING		
Fonološka struktura / Phonological structure	Riječ / Word	Čestotnost / Frequency	Fonološka struktura / Phonological structure	Riječ / Word	Čestotnost / Frequency
V-CV-CV	IDEJA	51	C-CCVC	UZDAH	1
CV-CVC	CELER	1	CCV-CVC	CVRKUT	296
CVC-CVC	POKLON	287	V-CV-CVC	ANANAS	1
CCV-CV-VC	STADION	50	CV-CV-CV	PUČINA	53
CCVC-CVC	TRAMVAJ	63	CV-CV-CCV	ZAKUSKA	1
V-CV-CV-CV-CV	ANOMALIJA	1	CVC-CV-CV	KULTURA	63
CV-CV-CV-CV	VJEVERICA	237	CV-CV-CCVC	VINOGRAD	251
VC-CV-CCCV-CV	INDUSTRIJA	24	CV-CVC-CCCV	BOGATSTVO	81
CCVC-CV-CCVC	PREDSJEDNIK	46	CV-CV-CCVC	REDOSLIJED	1
CV-CV-CV-CV-CCV	POLUGODIŠTE	31	CVV-CV-CV-CVCC	ZNAMENITOST	26
			CV-CV-CCV-CCV-CV	POLJOPRIVREDA	30

Uporabljena su tri složena zadatka fonološke svjesnosti: zadatak brisanja fonema, zadatak dodavanja fonema te zadatak premetanja (Tablica 3.). Čestice u zadacima brisanja i dodavanja varirane su prema fonološkoj strukturi te mjestu manipulacije. Fonemi su dodavani, odnosno brisani na početku riječi (ovisno o fonološkoj strukturi u slogu KV ili KKV), unutar početnog sloga u riječi (strukture KKV ili KKKV), u sredini riječi, unutar završnog sloga (strukture VKK) ili na samom kraju riječi.

Najsloženiji zadatak fonološke svjesnosti je zadatak premetanja u kojemu su sudionici trebali međusobno zamijeniti prve foneme u dvjema uzastopnim riječima. Čestice su varirane u fonološkoj strukturi: tri para riječi počinju strukturom KV (npr. *šapa – kuma*), u četiri para jedna zadana riječ počinje slogom KV, a druga suglasničkom skupinom KKV (npr. *trag – pup*). Zadnji par sadrži dvije riječi koje počinju suglasničkim skupinama (*vrat – brana*).

Tablica 3. Složeni zadaci fonološke svjesnosti: zadatak brisanja, zadatak dodavanja i zadatak premetanja fonema

Table 3. Complex phonological awareness tasks: deletion, addition and spoonerisms

BRISANJE FONEMA / DELETION		
Čestica / Task	Točan odgovor / Correct response	Fonološka struktura i mjesto manipulacije / Phonological structure and place of manipulation
KOSA – K	OSA	početni fonem, KV / initial phoneme, CV
KLANAC – K	LANAC	početni fonem, KKV / initial phoneme, CCV
STVAR – V	STAR	iz početne suglasničke skupine, KKKV / from initial consonant cluster, CCCV
PLOD – L	POD	iz početne suglasničke skupine, KKV / from initial consonant cluster, CCV
LUTKA – T	LUKA	iz sredine riječi / medial
KOALA – A	KOLA	iz sredine riječi / medial
PUST – S	PUT	iz završne suglasničke skupine, VKK / from final consonant cluster, VCC
ŠAPAT – T	ŠAPA	završni fonem / final phoneme
DODAVANJE FONEMA / ADDITION		
Čestica / Task	Točan odgovor / Correct response	Fonološka struktura i mjesto manipulacije / Phonological structure and place of manipulation
URA + B	BURA	početni fonem, KV / initial phoneme, CV
VILA + S	SVILA	početni fonem, KKV / initial phoneme, CCV
STOP + R	STROP	u početnu suglasničku skupinu, KKKV / to initial consonant cluster, CCCV
SAN + T	STAN	u početnu suglasničku skupinu, KKV / to initial consonant cluster, CCV
KULA + G	KUGLA	u sredinu riječi / medial
BAKA + LJ	BAKLJA	u sredinu riječi / medial

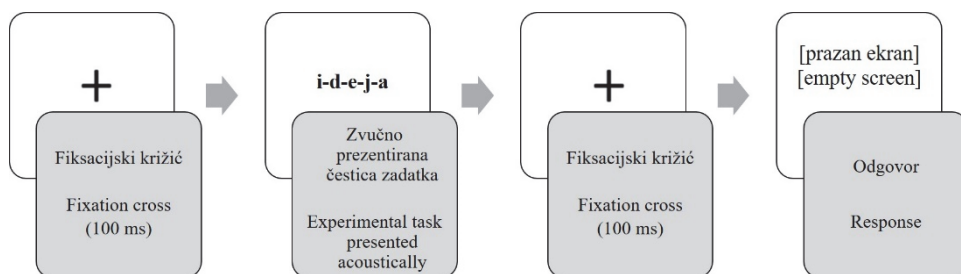
PAK + R	PARK	u završnu suglasničku skupinu, VKK / to final consonant cluster, VCC
TAVA +N	TAVAN	završni fonem / final phoneme
PREMETANJE FONEMA / SPOONERISMS		
Čestica / Task	Točan odgovor / Correct response	Fonološka struktura i mjesto manipulacije / Phonological structure and place of manipulation
METAK – PUŽ ŠAPA – KUMA RALICA – ŠUPA	PETAK – MUŽ KAPA – ŠUMA ŠALICA – RUPA	početni slog strukture KV / beginning syllable with the structure CV
PUH – SLAN TAVA – KRAVA ŽLICA – KUNA TRAG – PUP	SUH – PLAN KAVA – TRAVA KLICA – ŽUNA PRAG – TUP	početni slog strukture KV u jednoj riječi, a KKV u drugoj riječi / beginning syllable with the structure CV in one word and CCV in the other word
VRAT – BRANA	BRAT – VRANA	početni slog strukture CCV u obje riječi / beginning syllable with the structure CCV in both words

Kako je uz točnost mjereno i vrijeme odgovora, zadaci fonološke svjesnosti pripremljeni su u programu E-Prime. Čestice su snimljene u Akustičkom laboratoriju Odsjeka za logopediju Edukacijsko-rehabilitacijskog fakulteta u Zagrebu. Pripremljeni materijal čitala je profesionalna govornica hrvatskog jezika. Snimke su digitalizirane stopom uzorkovanja 44 kHz. Svi su zadaci imali istu strukturu (Slika 1.): nakon fiksacijskog križića u trajanju od 100 ms slijedila je zvučno prezentirana riječ te novi fiksacijski križić koji je bio znak sudioniku da može dati odgovor. Nakon što je sudionik odgovorio, ispitivač je stisnuo tipku na tipkovnici: [Y] za točan, a [U] za netočan odgovor. Ako je sudionik odgovorio s *Ne znam*, ispitivač je nakon pet sekundi pritisnuo [U]. Ako je sudionik neuobičajeno dugo čekao s odgovorom, ispitivač ga je pitao može li odgovoriti, a nakon toga pritisnuo [U]. U zadatku brisanja i dodavanja fonema sudionici su čuli ciljnu riječ i fonem koji je trebalo obrisati, odnosno dodati: npr. *Kosa, obriši K!* ili *Ura, dodaj B!* U zadatku premetanja prva je riječi ciljnog para izgovorena uzlaznom intonacijom, a druga riječ silaznom intonacijom.

U zadatku fonemske raščlambe sudionici su dobili uputu da riječ koju čuju trebaju "slovkati", odnosno razdvojiti na glasove. U zadatku stapanja fonema sudionici su dobili uputu da će čuti riječ izgovorenu glas po glas. Nakon što poslušaju glasove trebaju ih spojiti u riječ. U zadatku brisanja sudionici su dobili uputu da iz riječi koju čuju obrišu glas koji im je naznačen. Naglašeno je da trebaju obrisati samo jedan glas.

U zadatku dodavanja sudionici su dobili uputu da ciljni glas dodaju u riječ koju čuju na bilo koje mjesto. U zadatku brisanja i dodavanja naglašeno je da su točni odgovori "nove prave riječi", dakle riječi sa značenjem. U zadatku premetanja sudionici su dobili uputu da u dvjema riječima koje čuju zamijene prve glasove. Zadatak je dodatno pojašnjen na primjeru nakon čega su slijedili primjeri za uvježbavanje.

Za svaki je zadatak dana uputa da sudionici trebaju odgovoriti nakon što je prikazan fiksacijski križić. Nakon upute slijedila su dva primjera za uvježbavanje, a ako je ispitivač smatrao da sudionik nije razumio uputu, ponuđena su još dva primjera.



Slika 1. Eksperimentalni postupak u zadacima fonološke svjesnosti

Figure 1. Experimental procedure for the phonological awareness tasks

Varijable istraživanja:

I. Varijable točnosti: točnost u zadatku fonemskog stapanja, fonemske raščlambe, brisanja fonema, dodavanja fonema i premetanja

II. Vremenske varijable: vrijeme odgovora u zadatku fonemskog stapanja, fonemske raščlambe, brisanja fonema, dodavanja fonema i premetanja

3. REZULTATI

U uporabljenim zadacima fonološke svjesnosti provjerene su razlike među skupinama na svakom od zadataka, u točnosti i vremenu odgovora. S obzirom na različitu složenost čestica u zadacima provedena je analiza na razini čestica, tj. provjerene su razlike među skupinama za svaku pojedinu česticu u zadacima.

Razlike među skupinama testirane su t-testom za nezavisne uzorke koji je pokazao da su razlike statistički značajne u svim zadacima fonološke svjesnosti osim za vrijeme odgovora u zadatku fonemske raščlambe (Tablica 4., Slika 2.). Dakle,

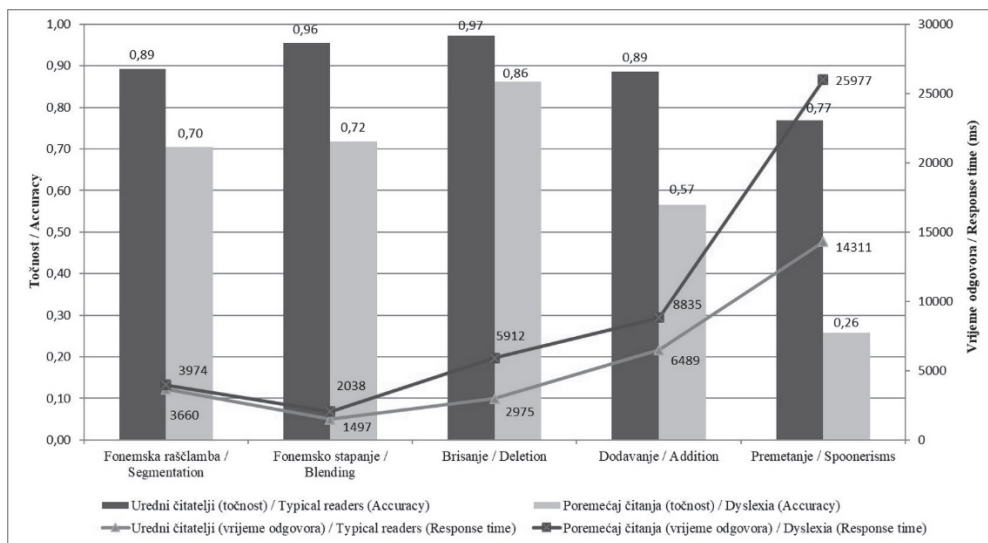
uredni čitatelji su u zadacima fonološke svjesnosti imali značajno veći broj točnih odgovora, ali im je bilo potrebno i značajno manje vremena za rješavanje zadatka. Najveće su razlike među skupinama prisutne u najzahtjevnijim zadacima: dodavanju fonema i premetanju. Ovi zadaci imaju i najveće veličine učinka (Tablica 4.). Iako zahtjevnost ovih zadataka vodi k duljem vremenu odgovora u obje skupine, čitatelji s poremećajem čitanja ipak su značajno sporiji od urednih čitatelja. Vrijeme odgovora u zadatku fonemskog stapanja nije pokazalo statistički značajne razlike među skupinama, što nije niti očekivano zbog prirode samog zadatka.

Tablica 4. Razlike među skupinama u zadacima fonološke svjesnosti
Table 4. Differences between the groups in all phonological awareness tasks

	Uredni čitatelji / Typical readers (N = 52)				Poremećaj čitanja / Dyslexia (N = 24)				<i>t</i>	<i>p</i>	Cohenov <i>d</i> / Cohen's <i>d</i>
	M	SD	Min.	Maks.	M	SD	Min.	Maks.			
Fonemska raščlamba / Segmentation											
TOČ / ACC	0,89	0,10	0,70	1,00	0,70	0,08	0,50	0,80	8,033	0,000	1,87
VR / RT	3659,90	855,63	1977,20	6441,40	3974,40	745,30	2785,10	6521,80	-1,549	0,126	0,36
Fonemsko stapanje / Blending											
TOČ / ACC	0,96	0,08	0,64	1,00	0,72	0,22	0,09	1,00	6,810	0,000	1,58
VR / RT	1497,16	415,50	734,73	2661,33	2037,88	387,33	1433,18	3284,00	-5,384	0,000	1,25
Brisanje fonema / Deletion											
TOČ / ACC	0,97	0,05	0,88	1,00	0,86	0,14	0,63	1,00	5,099	0,000	1,19
VR / RT	2975,35	1024,29	1283,88	5141,71	5912,21	1954,57	2957,57	10803,50	-8,610	0,000	2,00
Dodavanje fonema / Addition											
TOČ / ACC	0,89	0,13	0,50	1,00	0,57	0,23	0,13	0,88	7,700	0,000	1,79
VR / RT	6488,99	2665,48	2095,38	14222,43	8835,19	3667,06	2704,43	19118,00	-3,156	0,002	0,73
Premetanje fonema / Spoonerisms											
TOČ / ACC	0,77	0,20	0,25	1,00	0,26	0,21	0,00	0,63	10,374	0,000	2,41
VR / RT	14311,32	7259,35	3376,63	40791,33	25977,34	6343,14	14967,63	37857,00	-6,766	0,000	1,57

Statistički značajne razlike su podebljane, $p < 0,05$. / Significant differences are in bold, $p < 0,05$.

TOČ – točnost, VR – vrijeme odgovora / ACC – accuracy, RT – response time



Slika 2. Točnost i vrijeme odgovora u zadacima fonološke svjesnosti
Figure 2. Accuracy and response time in all phonological awareness tasks

Za svaki od zadataka provedena je analiza na razini čestica za varijablu točnosti. U zadatku fonemske raščlambe pronađene su značajne razlike na česticama *ideja*, *stadion*, *tramvaj*, *predsjednik* i *polugodište* (Tablica 5.). U česticama *ideja* i *stadion* pogreška koja se najčešće događala je dodavanje (u *stadion*) ili izostavljanje (u *ideja*) fonema /j/. U čestici *predsjednik* sudionici su zamjenjivali "ds" fonemom /cl ako ortografska reprezentacija riječi još nije usvojena, a ako je usvojena, ali nedovoljno precizna, sudionici su zamjenjivali slijed grafema "d" i "s" ili su fonem /d/ zamjenjivali fonemom /t/. Osim čestica koje su ispitivale odstupanja od hrvatske površinske ortografije, skupine su se razlikovale i na čestici *polugodište*, koja je najduža ispitivana čestica u zadatku, te čestici *tramvaj* koja je specifična jer sadrži dva medijalna sonanta na granici sloga od kojih je jedan često bio izostavljan ili je zbog specifičnih koartikulacijskih obilježja u realizaciji fonema /m/ on često mijenjan fonemom /n/. Zadatak fonemske raščlambe pokazao je slabu pouzdanost ($\alpha = 0,34$). Gledajući postignuće u obje skupine zajedno, u gotovo 50 % svih čestica točnost je bila iznad 90 % (Tablica 1. u Dodatku). Može se, dakle, zaključiti da je u jeziku površinske ortografije, kao što je hrvatski, u četvrtom razredu fonemska raščlamba usvojena, a točnost u zadatku pokazuje efekt stropa. Ipak, u česticama u kojima se nalaze odstupanja od jednoznačnog fonološko-ortografskog povezivanja, točnost je bila značajno niža i ove čestice su uspješno razlikovale skupine (Tablica 5.).

Tablica 5. Analiza čestica u zadatku fonemske raščlambe
Table 5. Item-based analysis for the segmentation task

	Uredni čitatelji / Typical readers		Poremećaj čitanja / Dyslexia		<i>t</i>	<i>p</i>	Cohenov <i>d</i> / Cohen's <i>d</i>
	M	SD	M	SD			
ideja	0,88	0,32	0,58	0,50	3,15	0,00	0,71
celer	1,00	0,00	0,96	0,14	1,48	0,14	0,40
poklon	1,00	0,00	1,00	-	-	-	-
stadion	0,87	0,34	0,63	0,02	2,45	0,02	0,10
tramvaj	0,94	0,24	0,46	0,00	5,69	0,00	2,82
anomalija	0,77	0,43	0,71	0,57	0,56	0,57	0,12
vjeverica	0,98	0,14	0,96	0,58	0,56	0,58	0,05
industrija	0,94	0,24	0,79	0,05	2,02	0,05	0,86
predsjednik	0,56	0,50	0,17	0,00	3,39	0,00	1,10
polugodište	0,98	0,14	0,79	0,00	2,97	0,00	1,92

Statistički značajne razlike su podebljane, $p < 0,05$.

Significant differences are in bold, $p < 0,05$.

U zadatku fonemskog stapanja skupine su se razlikovale u dvije trećine čestica (Tablica 6.). Točnost je opadala s porastom duljine riječi, s iznimkom riječi *zakuska* i riječi *poljoprivreda*, u obje riječi zbog utjecaja čestotnosti (*zakuska* ima vrlo nisku čestotnost što povećava broj pogrešaka, dok visoka čestotnost riječi *poljoprivreda* smanjuje broj pogrešaka unatoč duljini). Skupine su se razlikovale u svim česticama, osim u onim najkraćima (*uzdah*, *cvrkut*). Pouzdanost zadatka fonemskog stapanja je zadovoljavajuća ($\alpha = 0,79$).

U zadatku brisanja fonema sudionici su bili vrlo uspješni (Tablica 7.). Najnižu je točnost u obje skupine imala čestica *koala-a* kod koje su sudionici trebali odabrati koji fonem /a/ obrisati kako bi se dobila nova riječ sa značenjem. Za preostale čestice točnost je bila iznad 90 % u skupini urednih čitatelja, a u skupini sudionika s poremećajem čitanja iznad 80 %, uz iznimku riječi *lutka* ($M = 0,79$; $SD = 0,41$). Skupine su se razlikovale u samo četiri čestice: *kosa*, *plod*, *lutka* i *šapat*. Pouzdanost je ovog zadatka vrlo niska ($\alpha = 0,34$) stoga je napravljena analiza čestica i za vrijeme odgovora koja je pokazala da se skupine statistički značajno razlikuju u svim česticama ovog zadatka (Slika 3.). Sudionici s poremećajem čitanja su značajno sporiji u brisanju fonema, a rezultati upućuju da zadatak brisanja fonema nedovoljno dobro razlikuje skupine, ako se uzme u obzir samo varijabla točnosti.

Tablica 6. Analiza čestica u zadatku fonemskog stapanja
Table 6. Item-based analysis for the blending task

	Uredni čitatelji /		Poremećaj čitanja /		<i>t</i>	<i>p</i>	Cohenov <i>d</i> / Cohen's <i>d</i>
	Typical readers		Dyslexia				
	M	SD	M	SD			
uzdah	0,98	0,14	1,00	0,00	-0,68	0,50	0,20
cvrkut	0,96	0,19	0,88	0,34	1,41	0,16	0,29
ananas	1,00	0,00	0,79	0,41	3,65	0,00	0,72
pučina	0,98	0,14	0,79	0,41	2,97	0,00	0,62
zakuska	0,85	0,36	0,33	0,48	5,14	0,00	1,23
kultura	0,96	0,19	0,79	0,41	2,44	0,02	0,53
vinograd	0,98	0,14	0,71	0,46	3,90	0,00	0,80
bogatstvo	0,94	0,24	0,79	0,41	2,02	0,05	0,45
redoslijed	0,98	0,14	0,58	0,50	5,31	0,00	1,10
znamenitost	0,92	0,27	0,54	0,51	4,28	0,00	0,93
poljoprivreda	0,94	0,24	0,67	0,48	3,36	0,00	0,71

Statistički značajne razlike su podebljane, $p < 0,05$.

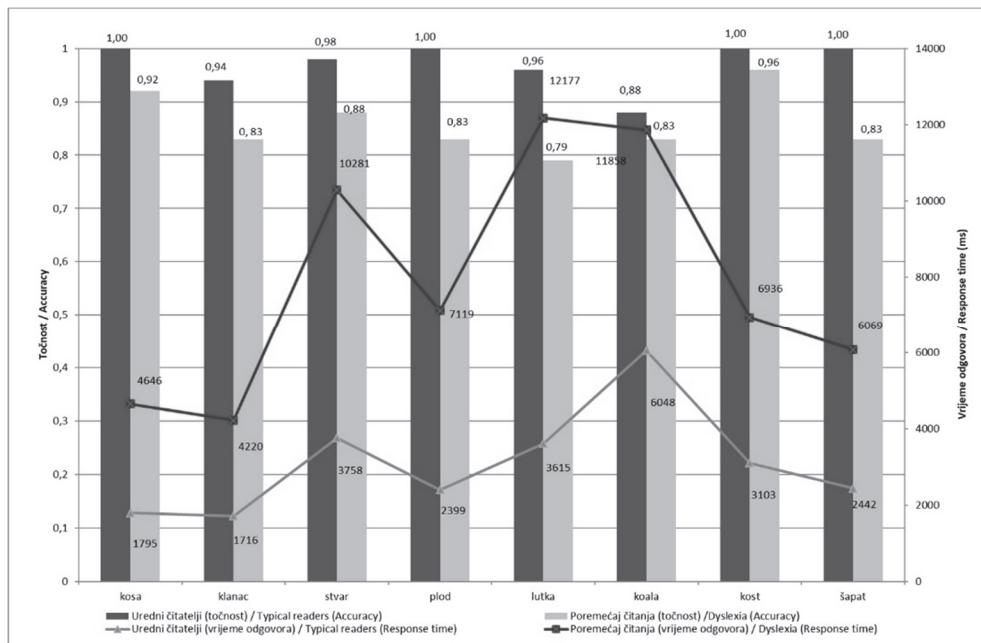
Significant differences are in bold, $p < 0.05$.

Tablica 7. Analiza čestica u zadatku brisanja fonema
Table 7. Item-based analysis for the deletion task

	Uredni čitatelji /		Poremećaj čitanja /		<i>t</i>	<i>p</i>	Cohenov <i>d</i> / Cohen's <i>d</i>
	Typical readers		Dyslexia				
	M	SD	M	SD			
kosa	1,00	0,00	0,92	0,28	2,15	0,04	0,40
klanac	0,94	0,24	0,83	0,38	1,53	0,13	0,35
stvar	0,98	0,14	0,88	0,34	1,94	0,06	0,39
plod	1,00	0,00	0,83	0,38	3,18	0,00	0,63
lutka	0,96	0,19	0,79	0,41	2,44	0,02	0,53
koala	0,88	0,32	0,83	0,38	0,61	0,54	0,14
kost	1,00	0,00	0,96	0,20	1,48	0,14	0,28
šapat	1,00	0,00	0,83	0,38	3,18	0,00	0,62

Statistički značajne razlike su podebljane, $p < 0,05$.

Significant differences are in bold, $p < 0.05$.



Slika 3. Točnost i vrijeme odgovora za pojedine čestice u zadatku brisanja fonema
Figure 3. Item-based analysis for the accuracy and the response time in the deletion task

S druge strane, u zadatku dodavanja fonema, sve su čestice značajno razlikovale skupine (Tablica 8.). U obje je skupine najviša točnost postignuta na česticama *tava* i *ura*, dakle u česticama u kojima je fonem trebalo dodati na početak odnosno na kraj riječi, bez teškoća koje donosi suglasnička skupina. U skupini urednih čitatelja najmanja je točnost za česticu *baka* ($M = 0,77$; $SD = 0,43$), s točnim odgovorom *baklja*. No, u skupini čitatelja s poremećajem čitanja najtežom se česticom pokazala čestica *san* ($M = 0,46$; $SD = 0,51$) gdje je točan odgovor zahtijevao umetanje fonema /t/ iza /s/ kako bi se stvorila suglasnička skupina "st", često smatrana jednim slivenim fonemom (Jelaska, 2004). Pouzdanost je ovog zadatka zadovoljavajuća ($\alpha = 0,67$). Zadatak ima dobru unutarnju konzistentnost i sve čestice uspješno razlikuju skupine.

Tablica 8. Analiza čestica u zadatku dodavanja fonema**Table 8.** Item-based analysis for the addition task

	Uredni čitatelji /		Poremećaj čitanja /		<i>t</i>	<i>p</i>	Cohenov <i>d</i> / Cohen's <i>d</i>
	Typical readers		Dyslexia				
	M	SD	M	SD			
ura	0,94	0,24	0,67	0,48	3,36	0,00	0,71
vila	0,90	0,30	0,50	0,51	4,34	0,00	0,96
stop	0,87	0,34	0,54	0,51	3,26	0,00	0,76
san	0,94	0,24	0,46	0,51	5,69	0,00	1,20
kula	0,90	0,30	0,54	0,51	3,90	0,00	0,86
baka	0,77	0,43	0,50	0,51	2,40	0,02	0,57
pak	0,79	0,41	0,50	0,51	2,63	0,01	0,63
tava	0,96	0,19	0,79	0,41	2,44	0,02	0,53

Statistički značajne razlike su podebljane, $p < 0,05$.

Significant differences are in bold, $p < 0.05$.

Najzahtjevniji, ali i najpouzdaniji zadatak je zadatak premetanja (Tablica 9.). Pouzdanost je ovog zadatka najviša ($\alpha = 0,80$). U svim se česticama točnost razlikovala između skupina.

Tablica 9. Analiza čestica u zadatku premetanja fonema**Table 9.** Item-based analysis for the spoonerisms

	Uredni čitatelji /		Poremećaj čitanja /		<i>t</i>	<i>p</i>	Cohenov <i>d</i> / Cohen's <i>d</i>
	Typical readers		Dyslexia				
	M	SD	M	SD			
metak-puž	0,92	0,27	0,46	0,51	5,21	0,00	1,13
šapa-kuma	0,77	0,43	0,33	0,48	3,98	0,00	0,96
ralica-šupa	0,77	0,43	0,33	0,48	3,98	0,00	0,96
puh-slan	0,60	0,50	0,21	0,41	3,33	0,00	0,85
tava-krava	0,88	0,32	0,33	0,48	5,89	0,00	1,34
žlica-kuna	0,77	0,43	0,08	0,28	7,19	0,00	1,90
trag-pup	0,63	0,49	0,13	0,34	4,64	0,00	1,19
vrat-brana	0,79	0,41	0,17	0,38	6,26	0,00	1,57

Statistički značajne razlike su podebljane, $p < 0,05$.

Significant differences are in bold, $p < 0.05$.

Suglasničke skupine su se i u ovom zadatku pokazale najtežima. Gledajući točnost obje skupine zajedno najniži su rezultati na česticama *pub-slan* ($M = 0,40$; $SD = 0,50$) i *trag-pup* ($M = 0,47$; $SD = 0,50$), dakle čestice u kojima je potrebno razdvojiti suglasničku skupinu kako bi se zamijenilo prve glasove u riječima (Tablica 5. u Dodatku). Najčešća je pogreška u ovim česticama bila zamjena cjelokupne suglasničke skupine umjesto prvog fonema, pa je odgovor sudionika bio *sluh* i *trup*, umjesto *suh* i *tup*. Zanimljivo je primijetiti da je čestica *tava-krava*, uzevši zajedničke rezultate obje skupine, imala vrlo visoku točnost ($M = 0,71$; $SD = 0,46$). Kako poredak riječi u odgovoru u zadatku premetanja fonema nije uziman u obzir (točnim odgovorom je smatran *kava-trava*, ali i *trava-kava*), moglo bi se zaključiti da je rima olakšavala rješavanje. Ovaj je efekt slabije vidljiv u skupini djece s poremećajem čitanja ($M = 0,33$; $SD = 0,48$). Najveća je razlika među skupinama pronađena na čestici *žlica-kuna* (Tablica 9.). Skupina djece s poremećajem čitanja ima izrazito nisku točnost na ovoj čestici ($M = 0,08$; $SD = 0,28$). Vrlo niska čestotnost riječi u točno premetnutom paru (*klica-žuna*) onemogućava leksički utjecaj i stavlja veći naglasak na radno pamćenje što dovodi do većeg broja pogrešaka.

4. RASPRAVA

Nedostaci u fonološkoj svjesnosti smatraju se jednim od pokazatelja narušene fonološke obrade u djece s poremećajem čitanja (Ramus, 2013), stoga su zadaci koji ispituju baratanje fonemima neizostavan dio kliničke procjene poremećaja čitanja. No, postignuća u ovim zadacima ovise o ortografiji jezika u kojem se fonološka svjesnost ispituje. Hrvatska površinska ortografija omogućuje relativno brzo ovladavanje fonološkom svjesnošću, stoga je ispitivanje fonološke svjesnosti u svrhu razlikovanja djece s poremećajem čitanja, nakon tri godine sustavne poduke u čitanju, izazov. Psiholingvistička teorija zrna (Ziegler i Goswami, 2005) promatra utjecaj dubine ortografije na razvoj fonološke svjesnosti i čitanja opisujući dostupnost, dosljednost i znatost fonoloških i ortografskih jedinica. U ovom je istraživanju uporabljeno pet zadataka fonološke svjesnosti: fonemska raščlamba, fonemsko stapanje, brisanje fonema, dodavanje fonema i premetanje, a čestice su varirane po fonološkoj duljini i složenosti, uzimajući u obzir odrednice ortografije. U analizi čestica se promatralo kako fonološka složenost i duljina te čestotnost utječu na uspješnost u ispitivanim zadacima. Mjerena je točnost, ali i vrijeme odgovora koje se

u nekim istraživanjima jezika s površinskom ortografijom pokazalo diskriminativnijom varijablom od točnosti (npr. Vaessen i sur., 2009).

Rezultati su pokazali da su razlike između urednih čitatelja i čitatelja s poremećajem čitanja u svim zadacima i u vidu točnosti i u vidu brzine statistički značajne, ali i da je točnost u zadacima fonemske raščlambe, stapanja i brisanja fonema vrlo visoka. Ovi su rezultati u skladu s istraživanjima u drugim jezicima s površinskom ortografijom koja pokazuju da u zadacima fonološke svjesnosti vrlo rano tijekom ovladavanja čitanjem dolazi do smanjivanja individualnih razlika i točnost se približava maksimalnom učinku (npr. Holopainen i sur., 2002 u finskom ili Durgunoğlu i Öney, 1999 u turskom). S druge strane, u zahtjevnijim zadacima, dodavanju fonema i premetanju, pronađene su veće razlike među skupinama u točnosti rješavanja zadataka. Caravolas i suradnici (2005) mjereći fonološku svjesnost u češkom zaključuju da u jezicima s površinskom ortografijom upravo složeniji zadaci otkrivaju razlike između urednih čitatelja i čitatelja s poremećajem čitanja. Ovaj zaključak podupiru i istraživanja u talijanskom (Paulesu i sur., 2001) i njemačkom (Landerl i sur., 1997).

Fonemska raščlamba i fonemsko stapanje ispituju pristupanje fonološkim, ali i ortografskim reprezentacijama riječi. U skladu s predviđanjima psiholingvističke teorije veličine zrna pokazalo se da ortografija značajno utječe na uspješnost u zadacima fonološke svjesnosti. U zadatku fonemske raščlambe, unatoč vrlo visokim rezultatima, primjećuje se lošiji učinak u česticama koje ispituju specifična ortografska pravila (npr. *ideja, stadion, predsjednik*). Kada se promotre zajednički rezultati u obje skupine sudionika, upravo je za ove čestice točnost rješavanja najniža, a analiza čestica pokazuje da se skupine razlikuju upravo u česticama u kojima fonološko-ortografsko povezivanje nije u potpunosti jednoznačno. Nadalje, razlikovnom se pokazala i čestica *tramvaj* kod koje koartikulacijski procesi otežavaju prepoznavanje fonema, dakle čestica u kojoj je smanjena dostupnost fonema. Pojava alofona dodatno nadmašuje teškoće koje vještini fonološke svjesnosti postavlja koartikulacija i nedosljednost je moguće riješiti samo prizivanjem ortografske reprezentacije riječi. Dakle, iako je hrvatska ortografija izrazito površinska, ispitivanje ortografskih reprezentacija, tj. "slovkanje" (engl. *spelling*) mjera je koja bi mogla uspješno razlikovati skupine i poduprijeti otkrivanje čitatelja s poremećajem čitanja nakon tri godine sustavne poduke. Vrlo visoka transparentnost hrvatske ortografije dovodi do zanemarivanja odstupanja koja se rijetko sustavno podučavaju, a tek sporadično ispituju. Upravo ova odstupanja najснаžnije razlikuju skupine – veća zrnatost kod skupina "ds" i "ts",

manja dosljednost kod pisanja ili izostavljanja grafema "j", smanjena dostupnost kod riječi u kojima se pojavljuju teže prepoznatljivi alofoni.

U zadatku fonemskog stapanja skupine je razlikovalo više od 70 % čestica, s očitim pomakom prema lošijim rezultatima s povećanjem duljine riječi u skupini s poremećajem čitanja. Ovakvi se rezultati mogu povezati s teškoćama radnog pamćenja, s obzirom da je u ovom zadatku izolirane foneme potrebno zadržati u radnom pamćenju sve dok i zadnji fonem nije izgovoren, a zatim ih spojiti u riječ. Teškoće radnog pamćenja jedan su od osnovnih nedostataka vezanih uz poremećaj čitanja (Ramus, 2013). Odstupanja od ovog obrasca u riječima *zakuska* i *poljoprivreda* upućuju na utjecaj leksičkog znanja. Utjecaj ortografije u ovom je zadatku manji (npr. čestica *bogatstvo* ima relativno dobru točnost u obje skupine) vjerojatno zato što je i dosljednost hrvatske ortografije u smjeru grafem-fonem veća nego u smjeru fonem-grafem: dok se /c/ može zapisati i kao "c" i kao "ds" ili "ts", sve ove tri inačice u izgovaranju postaju isti fonem.

Brisanje fonema je najčešće korišten zadatak fonološke svjesnosti kod djece školske dobi te odraslih (npr. Bruck, 1992; de Jong i van der Leij, 2003), no istraživanja su pokazala da je ovaj zadatak u jezicima s površinskom ortografijom često nedovoljno osjetljiv te ne otkriva individualne razlike u fonemskoj svjesnosti (de Jong i van der Leij, 2003; Landerl i Wimmer, 2000). I rezultati u ovome istraživanju su pokazali da su sudionici u zadatku brisanja postigli rezultat vrlo blizu maksimalnog učinka. Analiza čestica pokazuje da u vidu točnosti samo četiri čestice uspješno razlikuju skupine. No, kada se uzme u obzir i vrijeme odgovora, skupine se statistički značajno razlikuju u svim česticama ovog zadatka što pokazuje da su sudionici s poremećajem čitanja značajno sporiji u brisanju fonema od svojih vršnjaka. Zadatak brisanja fonema uspješno razlikuje skupine tek kada se uključi i varijabla vremena rješavanja zadatka što podupire razmišljanje Vaessena i suradnika (2009), koji u jezicima s površinskom ortografijom preporučuju uporabu zadatka brisanja s vremenskim ograničenjem.

U zadacima dodavanja fonema i premetanja sve su čestice uspješno razlikovale skupine. Oba zadatka snažno podupiru radno pamćenje i leksičko znanje. U zadatku dodavanja fonema ciljnu je riječ potrebno zadržati u radnom pamćenju te zadani fonem dodavati na različita mjesta u riječi sve dok mentalni leksikon ne prepozna riječ sa značenjem. Djeca s oskudnim i nedovoljno funkcionalnim radnim pamćenjem mijenjaju ciljnu riječ ili ju jednostavno ne mogu zadržati dovoljno dugo da bi riješili zadatak. Oskudan rječnik može dovesti do neprepoznavanja premetnute riječi i

odbacivanja točnog odgovora misleći da se ne radi o pravoj riječi (npr. riječi *klica*). Zadatak premetanja je još zahtjevniji za radno pamćenje jer uključuje dvostruku manipulaciju zadržanim česticama. Zahtjevi su veći u inačici zadatka u kojoj je potrebno zadržati i redosljed riječi. Zadatak premetanja se pokazao dovoljno osjetljivim i s uputom koja dopušta zamjenu riječi stoga u ovoj ciljnoj skupini nije potrebno povećavati zahtjevnost zadatka.

Iako je fonološka svjesnost metajezična vještina koja daje uvid u funkcioniranje fonološkog sustava, važno je imati na umu da zadaci fonološke svjesnosti snažno ovise o radnom pamćenju. S druge strane, složeni zadaci fonološke svjesnosti daju uvid i u ortografsku svjesnost jer ortografska reprezentacija podupire fonološku reprezentaciju zadržavanu u radnom pamćenju tijekom rješavanja zadatka. Uistinu, mnoga djeca nastoje zamisliti napisanu riječ ili čak pokušavaju riječ "napisati" prstom po zraku ili stolu kako bi poduprli radno pamćenje i uspješnije zadržali ciljnu riječ. Ove su razlike važne kada se nastoji razdvojiti utjecaj pojedinih sposobnosti i vještina na čitanje (npr. pri promatranju prediktora čitanja), no ne umanjuju vrijednost zadataka fonološke svjesnosti u prepoznavanju poremećaja čitanja u kliničkoj praksi. Rezultati ovog istraživanja mogu dati korisne početne smjernice u pripremi ispitnih materijala za procjenu poremećaja čitanja. No, za detaljnije razumijevanje razvoja fonološke svjesnosti u hrvatskom, potrebna su iscrpnija istraživanja utjecaja rječnika, radnog pamćenja te ortografskih posebnosti.

5. ZAKLJUČAK

Dobiveni rezultati pokazuju da površinska ortografija hrvatskog podupire razvoj fonološke svjesnosti te su u većini zadataka obje skupine postigle visoku razinu točnosti. No, skupine se statistički značajno razlikuju na svim mjerenim zadacima. Analiza čestica pokazuje da zadatak fonemske raščlambe, unatoč vrlo visokim rezultatima, uspješno razlikuje skupine kada se uzmu u obzir čestice u kojima fonološko-ortografsko povezivanje nije potpuno površinsko što upućuje da je ovim slučajevima povezivanja potrebno posvetiti posebnu pažnju, kako pri procjeni poremećaja čitanja, tako i u formalnoj poduci čitanja i pisanja. Kada se promatraju rezultati u zadatku fonemskog stapanja uočava se utjecaj duljine i čestotnosti riječi na uspješnost rješavanja. Zadatak brisanja fonema pokazao se manje osjetljivim u hrvatskom ako se mjeri samo varijabla točnosti. Zahtjevniji zadaci, zadatak dodavanja fonema i premetanja, razlikuju skupine s visokom pouzdanošću.

Zadaci fonološke svjesnosti uspješno su razlikovali uredne čitatelje i čitatelje s poremećajem čitanja. Analiza čestica provedena u ovome istraživanju pokazuje da je potrebno obratiti pozornost na specifičnosti ortografije, fonološku duljinu i složenost čestica te leksičku čestotnost pri oblikovanju zadataka fonemske svjesnosti kako bi se povećala njihova osjetljivost u prepoznavanju djece s poremećajem čitanja.

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PRILOG / APPENDIX

Dodatne tablice / Additional tables

Tablica 1. Točnost za pojedine čestice na cjelokupnom uzorku u zadatku fonemske raščlambe**Table 1.** Item-based overall accuracy in the segmentation task

	M	SD
poklon	1,00	0,00
celer	0,99	0,11
vjeverica	0,97	0,16
polugodište	0,92	0,27
industrija	0,89	0,31
ideja	0,79	0,41
stadion	0,79	0,41
tramvaj	0,79	0,41
anomalija	0,75	0,44
predsjednik	0,43	0,50

Tablica 2. Točnost za pojedine čestice na cjelokupnom uzorku u zadatku fonemskog stapanja**Table 2.** Item-based overall accuracy in the blending task

	M	SD
uzdah	0,99	0,11
cvrkut	0,93	0,25
ananas	0,93	0,25
pučina	0,92	0,27
kultura	0,91	0,29
bogatstvo	0,89	0,31
vinograd	0,89	0,31
poljoprivreda	0,86	0,35
redoslijed	0,86	0,35
znamenitost	0,80	0,40
zakuska	0,68	0,47

Tablica 3. Točnost za pojedine čestice na cjelokupnom uzorku u zadatku brisanja fonema

Table 3. Item-based overall accuracy in the deletion task

	M	SD
kost	0,99	0,11
kosa	0,97	0,16
plod	0,95	0,22
stvar	0,95	0,22
šapat	0,95	0,22
lutka	0,91	0,29
klanac	0,91	0,29
koala	0,87	0,34

Tablica 4. Točnost za pojedine čestice na cjelokupnom uzorku u zadatku dodavanja fonema

Table 4. Item-based overall accuracy in the addition task

	M	SD
tava	0,91	0,29
ura	0,86	0,35
san	0,79	0,41
kula	0,79	0,41
vila	0,78	0,42
stop	0,76	0,43
pak	0,70	0,46
baka	0,68	0,47

Tablica 5. Točnost za pojedine čestice na cjelokupnom uzorku u zadatku premetanja

Table 5. Item-based overall accuracy in the spoonerisms

	M	SD
metak – puž	0,78	0,42
tava – krava	0,71	0,46
ralica – šupa	0,63	0,49
šapa – kuma	0,63	0,49
vrat – brana	0,59	0,49
žlica – kuna	0,55	0,50
trag – pup	0,47	0,50
puh – slan	0,47	0,50

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From phonemic segmentation and blending to spoonerisms – deficits in phonological awareness in children with dyslexia in Croatian

Summary

Phonological awareness (PA) is one of the best predictors of reading and deficits in PA are considered to be one of the clinical markers of dyslexia. However, the role of PA in reading depends on the age, the amount of systematic reading instruction, lexical and phonological constraints of the tasks and the consistency of the target orthography. There is evidence that mostly used PA tasks in transparent orthographies do not discriminate readers with reading disorder and typical readers. On the other hand, there is also evidence for the opposite assumption when tasks are more complex or not only accuracy, but also speed is taken into account. The goal of this research was to compare readers with reading disorder and their typically developing peers in different PA tasks in Croatian (segmentation, blending, deletion, addition, spoonerisms), measuring accuracy, speed and analysing the items.

The results showed that the consistency of the Croatian orthography positively affects PA since both groups of participants achieved high levels of accuracy in most of the tasks. These results are in line with the findings that PA tasks in the orthographically transparent languages are at the ceiling very early during the development of reading. However, despite transparent orthography, the tasks were successfully discriminating the groups and in more demanding tasks; addition and spoonerisms, bigger differences were found between the groups. Item analysis showed the necessity of taking into account the specificity of the orthography, phonological length and complexity and lexical frequency when constructing the tasks in order to achieve better sensitivity in discriminating the readers with the reading disorder. In the segmentation task items where the phoneme-grapheme mappings are not perfectly matching tended to discriminate the groups leading to the conclusion that spelling, after three years of formal reading instruction, is a measure which can support screening for reading difficulties in Croatian. Deletion, which is the most common complex PA task, proved to be less discriminative in Croatian if only accuracy is measured. When response time was

taken into account, all the items were significantly differing between the groups indicating that in Croatian speeded deletion task could be more sensitive. More complex tasks, addition and spoonerisms, systematically discriminated the groups and showed the best reliability.

Key words: phonological awareness, consistent orthography, reading disorder

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The role and structure of pauses in Slovenian media speech

Summary

This article explores pauses in terms of the roles they play in speech and their structural composition. They are perceived as the indispensable acoustic and/or semantic break in the flow of speech and are considered an important marker and organizer of speech. The study, based on a corpus of selected Slovenian talk shows (i.e. authentic and relatively spontaneous media speech), showed that 1) on average cognitive or communicative pauses (not physiological ones) predominate among the speakers analyzed, 2) speakers most often interrupt their speech to look for the right formulation and to plan syntactic structures and the segmentation of the flow of speech, 3) on average, empty or silent pauses, which primarily but not exclusively perform the role of breathing, are the most common among the speakers analyzed, and 4) with all the speakers analyzed, drawn-out schwas (*uh* sounds) occur most often among filled and "silent-filled" pauses.

Key words: text phonetics, pause, role of pauses, structure of pauses, media speech

1. INTRODUCTION

Prosodic characteristics – which, according to Toporišič (1976), include pauses, sentence stress, intonation, register, speech tempo, and tone – have been researched relatively little in Slovenian linguistics. Toporišič defines them as "auditory characteristics of a simple or multiclausal sentence" (Toporišič, 1992, p. 308), which in writing can be partially replaced by punctuation. In his definition of spoken language, Toporišič proceeds from a unit of written text (rules mostly promote more correct and easier reading of written texts), primarily having in mind the clause as the research unit:

Because the smallest possible message is a sentence in the syntactic form of a clause or multiple clauses which can also simply be referred to as sentence phonetics. In principle, text phonetics should cover the auditory characteristics of a text as a whole; however, in its current state, it only covers the auditory features between the individual sentences at most, whereas it barely deals in any detail with the auditory characteristics of a sentence and, of course, especially a clause. (Toporišič, 2000, p. 533).

Several weaknesses in the research premises can be observed with past researchers (or better, reporters) of (spontaneous) Slovenian speech: their studies were not based on authentic or spontaneously spoken material, but on a reading of a written text; in addition, researchers primarily used literary texts, which from the present research perspective most likely do not provide the most representative sample of spoken language, and their findings were largely not the result of extensive research, but more or less subjective observation of individuals (e.g. Podbevšek, 2006; Toporišič, 1972). From the perspective of more recent text-phonetic research, combining both media (i.e. spoken and written) or studying text phonetics based on the methodological principles of the written medium is a major weakness. The principles of spoken language are completely different from written language and therefore different research premises apply to it; for example, for a relevant analysis of pauses speech must be transcribed without punctuation and capitalization, otherwise possible locations and lengths of pauses may be implicitly suggested to the person tested. With the development of new software tools for the analysis of speech production (e.g. Praat; Boersma & Weenink, 2013) and corpus linguistics, studies of Slovenian speech also tend to be increasingly based on representative corpora of audio material or on real

and spontaneous speech – that is, the most authentic part of speech (e.g. Tivadar, 2009; Valh Lopert, 2005).

The speech of politicians appearing on talk shows and the speech of TV presenters are part of media speech, which viewers often completely unconsciously or unknowingly perceive as a speech model, example, ideal, or standard: "Under the influence of spoken mass media and the school system, today the majority of people have a certain idea of what standard pronunciation should sound like. This idea is more or less superficial, or naive, but it does exist." (Škarić, 1988/1999, p. 205). Because "media speech is in principle the *'ideal speech realization'* or a speech realization most harmonized with the norm" (Vitez, 1999, p. 42), it offers an ideal opportunity to observe how the speech of trained speakers deviates from an ideal or a language norm. Media speech, "as a rule, entails consistent actualization of a prescribed language system and its bearers are speakers that, despite consciously taking the system into account, are simultaneously subjected to the influence of spontaneous phenomena and their changes in general spoken usage." (Vitez, 1999, p. 42).

2. THEORETICAL BACKGROUND AND PREVIOUS FINDINGS

When studying speech, one must take into account the fact that the success of communication also often depends on the (at least partial) semantic overlap between what one wants or intends to say and what one actually says, or between an idea and the realization of that idea. Especially speakers that are somewhat less skillful at public speaking (as well as well-versed speakers) often ask themselves "Where was I?" during speech, which for various reasons is interrupted for a shorter or longer period of time. According to psycholinguistic theories (e.g. Garman, 1990), a break in the flow of speech must not be too long in order to successfully complete a speech act. Even though the human memory for sticking to the central theme of the conversation is relatively long compared to that for grammatical forms, it often happens that due to a short grammatical memory, speakers also have problems with content organization and ultimately reach a point where they can no longer continue a conversation because they have forgotten both the grammatical and semantic beginning of the speech unit (Garman, 1990). This problem can most easily be resolved by starting a specific utterance again, whereby various pauses or breaks in the flow of speech can also be used. Hence, for example, vocalized or filled pauses of the type *veš* 'you know', *vidiš* 'you see', *hm*, *aha*, and *Kaj sem že hotel reči?* 'Where was I?' are used in dialog speech

when speakers want to communicate to their listeners that they have not yet finished speaking or that they do not yet intend to pass the role of the speaker to someone else. The opposite is true for empty pauses, which are used when the speaker finishes speaking and wants to pass the role of the speaker to someone else. In the context of dialog, filled pauses refer to speech overlaps, various repetitions, false starts, self-corrections, and so on. All of these pauses in the speech chain are indicators of the cognitive process at various levels, from planning the conversation topic to searching for words and structuring utterances (Horga, 1996; Kranjc, 1996/1997).

In spontaneous speech, planning the production of speech is often incomplete, leading to various disruptions in the flow of speech. The concomitance of planning and carrying out spontaneous speech production causes hesitancy, repetition, correction, and so on in speech. This can be referred to as unevenly distributed continuous and discontinuous phases of speech, in which speech researchers have detected a tendency for breaks in the flow of speech to occur more frequently in completely unprepared speech situations, whereas in less spontaneous situations (e.g. reading or reciting) they are slightly less frequent. In addition, spontaneous speech often contains pauses in processing or planning, including articulated pauses with repetitions and drawn-out sounds, and unarticulated loud pauses, whereas in non-spontaneous or prepared speech syntactically logical pauses are more common (e.g. Campione & Vérinos, 2002; Garman, 1990; Horga, 1996; Horga & Mukić, 2000).

Good/trained/professional speakers distinguish themselves from poor/untrained/unprofessional speakers primarily by the successfulness of preparing speech production and less by its implementation. Professional speakers are usually much more successful in preparing speeches, which also affects the fluency of implementation: a well-prepared speech contains less hesitation (fewer empty or silent pauses as well as filled or acoustic pauses), which also affects the speech tempo. Slow speakers thus make significantly more breaks in their flow of speech than fast or faster speakers (Horga, 1996).

2.1. The roles of pauses in speech

Variety of roles performed by pauses in the flow of speech were mentioned in previous studies. Authors most often use various combinations of both basic categories (i.e. *physiological* and *communicative*), and merge or introduce additional (sub)categories, which mainly depends on the research purpose. In producing speech, speakers must continuously coordinate the biological process of breathing with speech production,

resulting in pauses conditioned by breathing because it is impossible to coordinate both processes (i.e. breathing and speaking) perfectly (Horga, 1996). Respiratory pauses appear as part of phonation or sound formation, most often in agreement with grammatical units, such as words, word combinations, and clauses. Butcher (1981, as cited in Garman, 1990) studied German speech and determined that the respiratory pauses that the speakers made while reading, reciting, or speaking spontaneously were 2.5 times more frequent between than within sentences. Respiratory pauses between clauses were also more frequent than those within clauses, even though in spontaneous speech that was slightly less common than in reading and reciting (i.e. in prepared speech). From the psycholinguistic perspective, Goldman-Eisler (1972, as cited in Garman, 1990) distinguishes the cognitive role (planning speech; e.g. syntax, searching for words, etc.) and the communicative role (the speaker communicates divisions in the flow of speech to the listener) of pauses from the physiological role (i.e. breathing). Breaks in the speech chain most often develop before the occurrence of new thought units that can be interpreted as speech planning points. Especially in spontaneous speech, pauses are accompanied by various gestures, gesticulation, and facial expressions, which need to be distinguished from the same phenomena in a continuous speech flow, where, for example, they emphasize the individual parts articulated.

Zellner (1994) uses two classifications of pauses. As part of the first classification, he refers to the physical and linguistic functions of pauses, and as part of the second he refers to their psychological and psycholinguistic functions. Perceptual pauses – that is, speakers' pauses that listeners perceive – do not completely overlap with physiological ones because people often have a higher visual or hearing threshold of perception than the actual physiological stimulus. Hence on the one hand, the occurrence and duration of pauses depends on the physiological characteristics of speech or the speaker's physical activity during speech and, on the other, on cognitive processes or speech planning. Sabol and Zimmermann (1978) refer to pauses with a physiological role (breathing), a communicative role (successful communication), and an expressive role (emphasizing important parts of the speech chain), and pauses that occur due to the speaker's hesitation. Pauses are classified similarly by Viola and Madureira (2008): speakers make respiratory pauses to take a breath, discursive pauses to plan the discourse structure, and expressive pauses to express their attitude or feelings toward something or someone. In their study of pauses used by native and second-language speakers of English and German, Bilá and Džambová (2011)

established that pauses are more frequently used by second-language speakers and that discursive pauses predominate with both (native and second-language speakers); in addition to discursive pauses, they also report hesitation, politeness, multifunctional, and expressive pauses as well as respiratory and nonfunctional pauses.

Škarić (1991) refers to vocalized (filled) and non-vocalized (empty or silent) pauses. With regard to filled pauses in particular, he mentions the delimiting role (syntactically logical and rhythmic pauses), culminative role (pauses used to emphasize or highlight something), lexical role (a pause used instead of a specific word that has the same meaning as the word that has not been spoken), processing role (slowing the communicational speech flow down in order to attract attention or check whether the listener has understood what has been said), and the role of interrupting the flow of speech (coughing, sneezing, swallowing, inhaling, drinking water, gesticulating, etc.). An almost identical classification is used by Horga and Mukić (2000), who divided pauses into six main categories in terms of their duration and function: delimiting pauses (syntactically logical pauses setting apart syntactic and logical speech units, and rhythmic pauses form rhythmic units), pauses between speech segments (setting apart longer semantic-syntactic units), emphasizing or highlighting pauses (stressing the word following a pause within a sentence), lexical pauses (replacing a specifically defined word in speech), mixed pauses (simultaneously delimiting and highlighting a specific word at the same time), and processing or planning pauses (expressed through both non-vocalized or empty pauses and drawn-out sounds, various forms of hesitation and corrections of articulated parts of speech – such as syllables, words, word combinations, and entire sentences – and non-articulated, non-phonemic sounds, as well as various forms of speech defects and their corrections).

Podbevšek (2006) studied pauses in Slovenian theater speech and classified them as follows: content-rhythmic pauses (logical distribution of pauses across text, following the logic of speech rather than writing; used especially by trained speakers), syntactically logical pauses (placing more emphasis on punctuation when reading or interpreting written texts; used primarily by untrained speakers), emotional, emphasizing, or highlighting pauses (giving special meaning to words in front of them; they are usually longer than others and therefore slow down the speech tempo at the same time), slowing-down pauses (they are short and have a rising intonation), and pauses as errors (illogical and unplanned).

Most researchers agree that the physiological need to breathe is the most important (but not the only) factor for pausing:

Speech is produced by modulating the airflow from the lungs. As a consequence, it is necessary for all speakers to insert a certain number of respiratory pauses while speaking. Respiratory pauses, which represent only a part of all pauses, can be considered physiological necessities. The constraints due to the production apparatus explain the basic similarities in pausing between languages. The probability of occurrence of a pause during continuous speech seems to depend on the amount of residual air in the lungs. It has been shown (...) that breathing during speech exerts an influence at similar time intervals independently of the language spoken (...). The most striking similarity between languages is that breathing (respiratory pausing) occurs at grammatical junctures. At fast rates, the physiological need to breathe is the sole determinant of pausing (...) Breathing is dependent on syntax: speakers will only breathe when allowed to do so, as it were, by the constituent structure of the utterance. (Vaissière, 1983, pp. 54–55).

2.2. The structural composition of pauses

Despite various theories about what can be classified as pauses, the term pause continues to be conceived primarily as silence in the flow of speech (e.g. Toporišič, 1972, 2000). The speech chain is thus interrupted in certain places, which in writing is most often replaced by punctuation. Some pauses (e.g. respiratory pauses) can indeed be heard primarily as silence in the acoustic sense, but there are also pauses in speech that can be heard as drawing out various sounds, words, and the like, or as a mix between the two types. In terms of the presence or absence of a sound signal, what fundamentally appears in speech are silent (or empty, unfilled, non-vocalized, absolute, and physiological) pauses and filled (or vocalized, acoustic, and relative) pauses. Pauses filled with individual sounds, words, and so on have primarily been discussed by speech researchers outside Slovenia, with differences occurring in the subcategories of filled pauses. According to Garman (1990), verbal fillers also include certain autosemantic words and word combinations that are not proper sentence elements (they perform the role of presenting a specific opinion, etc.), do not have a semantic role in the current speech, and primarily depend on other utterances, but perform the highly important role of fillers. These are words of the type *torej* 'so', *vidiš* 'you see', *veš* 'you know', and *mislím* 'I think', which under certain circumstances serve as preparation for maintaining speech production. Cruttenden (1986), Zellner (1994), and Viola and Madureira (2008) also refer to silent (unfilled) and filled pauses. With silent pauses, listeners perceive a silent or an interrupted part in the sound signal (e.g. after taking a breath or when swallowing), whereas with filled pauses

they perceive an additional vocalized part in the speech signal, such as drawn-out sounds, repeated utterances, words, syllables or sounds, and false starts. Similarly, Horga (1996) also differentiates between empty or silent and filled or vocalized pauses. He divides breaks in the flow of speech filled by vocalization (according to Horga, these often include speech defects) further into repetitions, false starts without repetition, false starts with repetition, corrections, exclamations, stuttering, and awkward pronunciation. Horga recognizes that not all pauses or breaks in the speech chain are errors, but that they are also structural elements of ideal speech. Škarić (1991) divides pauses into vocalized and non-vocalized pauses, in which a sound in the pause can be articulated (repetitions of syllables, words, and word combinations, drawn-out sounds, and fillers) or unarticulated (the schwa, rounded and/or nasal vowels, drawn-out /m/, sighs, and so on).

In exceptional cases, Slovenian researchers also divide pauses in terms of the presence or absence of the sound signal in speech. Because respiratory organs function as producers of speech, text-phonetic characteristics may already form during breathing: with *absolute* or *physiological* pauses, the flow of speech is completely interrupted for a while. Speech is usually interrupted by taking a breath because the exhaled air is used in speaking, and breaks are organized so that they create an impression of speech continuity (Bezljaj, 1971; Podbevšek, 2006). With relative pauses, the flow of speech is merely dampened and not completely interrupted, and, according to Bezljaj (1971), additional segmentation of relative pauses is unnecessary. Podbevšek (2006) mentions silence as a special type of pause, meaning the absence of speech or any other human sound activity. Of course, not every silence is part of communication, but, if it is, it is an important component with many meanings. As part of her analysis of dialog speech, Zemljarič Miklavčič (2008) also refers to the following typical breaks in the spontaneous speech chain in addition to traditional (i.e. silent) pauses: repetitions often occur immediately after a silent pause, false starts, corrections (paraphrasing) are a widespread category of false starts (words and word combinations are fully vocalized but the speaker corrects them or vocalizes again in a different grammatical form, order, or with a different word, etc.), overlapping or simultaneous speech by several speakers, and other acoustic events, such as laughter, which can also cause breaks in speech fluency.

3. AIMS OF THE STUDY AND HYPOTHESES

Because relatively little text-phonetic research has been performed on Slovenian material (e.g. Podbevšek, 2006; Volk, 2011), one of the goals of this study is to test the approaches already established abroad (e.g. Cruttenden, 1986; Horga, 1996) on Slovenian material because, regardless of the characteristics of individual languages, researchers (Vaissière, 1983, and studies cited therein) have established that practically all speakers have the same or at least very similar production and perception capabilities. This means they face the same physiological constraints in speech production and reception. Acoustic analyses of speech production in different languages (Vaissière, 1983, and analyses cited therein) show that speakers insert a relatively large number of pauses into their speech and that the ratios between the sequences of pure articulation and the total speech duration (i.e. including pauses) barely differ from one language to another.

This study uses two methodological approaches (analysis of pauses from the perspective of their roles in speech and their structural composition; see section 4) to test the research hypotheses that derive from Slovenian linguistic reality and the observation of Slovenian media (political) speech. The first hypothesis proposes that physiological pauses (not cognitive or communicative ones)¹ – and, among them, respiratory pauses in particular – predominate in the speech of both politicians and TV presenters. This hypothesis is based on the subjective premise that speakers predominantly make respiratory pauses and on the common conception of pauses being nothing but vocally unfilled segments of speech or instances in which the flow of speech is interrupted by silence.

The second hypothesis presumes that among cognitive or communicative pauses both politicians and TV presenters primarily make pauses to look for the right formulations and to plan syntactic structures of speech. A hypothesis framed this way is very difficult to prove if one cannot read speakers' minds or does not ask them why they made a particular pause, and because speakers may often make a particular pause for more than one reason at the same time (several different roles can be identified

¹ The terms physiological, cognitive, communicative, discursive, and other pauses are defined in greater detail in section 4 (especially in Table 1); basically, this involves division into pauses that the speakers make primarily because of breathing (a human physiological need) and pauses that speakers make to facilitate communication (planning and segmenting speech, emphasis, alternating the role of speaker, etc.).

within an individual pause). Although the analysis involves a certain degree of assumption of why speakers made pauses, this involves a systematic assumption by the researcher, who defines the role of pauses in the entire corpus according to the same (albeit also subjective) criteria. One therefore does not obtain absolute values this way – which was also not the basic purpose of the study – but instead relative relations, and thereby the tendencies for the occurrence of pauses in terms of their roles among the speakers analyzed in the corpus. This hypothesis is based on the results of similar studies performed on non-Slovenian material (e.g. Bilá & Džambová, 2011; Butcher, 1981; Goldman-Eisler, 1972; Horga & Mukić, 2000; Viola & Madureira, 2008; Zellner, 1994; for a more detailed explanation, see section 2.1.). A study by Bilá and Džambová (2011) shows that speakers primarily make discursive pauses (see note 1 and section 4). Hence it can be presumed that, among all the cognitive or communicative roles, both politicians and TV presenters make the majority of pauses to look for the right formulations and to plan syntactic structures of speech. However, this does not mean that these pauses also dominate the speech of both types of speakers in general; as suggested by the first hypothesis, physiological pauses and especially respiratory pauses predominate.

The third hypothesis claims that the filled pauses used by both politicians and TV presenters primarily include various repetitions and lengthening of language units. Like the first hypothesis, this hypothesis is also based on the subjective premise that filled pauses in speech primarily include various repetitions (of syllables, words, word combinations, etc.) and lengthening of language units (especially individual sounds).

4. MATERIAL, SPEAKERS, AND RESEARCH METHODS

To analyze pauses in Slovenian media speech, a corpus of authentic and more or less spontaneous speech of three male and three female politicians and five male and four female national TV presenters was compiled. It includes dialogues, multilogues, and monologues that turn into dialogues recorded in the Ljubljana studios of TV Slovenia without an audience. The specialized speech corpus is composed of ten segments of the talk shows *Intervju*, *Pogovor s predsednikom vlade*, *Vroči stol*, *Pod žarometom*, *Omizje*, and *Studio City* with a total duration of over two hours, and was compiled for the purposes of a broader combined auditory-experimental method of studying

the speech of TV presenters (trained speakers) and politicians (probably less trained speakers) on selected TV Slovenia talk shows (Huber, 2013). It was used as one of the sources for constructing the research hypotheses and as the only source for testing them. All the talk shows analyzed, which were aired between 2006 and 2007 during evening slots, have a similar concept: a conversation between the presenter and the politician(s) about current or recent political developments. The politicians speak mostly spontaneously, whereas the presenters speak both spontaneously and partially spontaneously, or even non-spontaneously (for instance, when presenting the guests and the show's theme); a similar methodological approach to the analysis of pauses from the perspective of the roles they play in speech among (non)professionals on Croatian daily television news was used in the study by Horga and Mukić (2000). The focus was primarily on analyzing spontaneous speech – that is, the speech of politicians (male politicians: 44 min 51 s, female politicians: 37 min 51 s, male presenters: 20 min 35 s, female presenters: 15 min 23 s), which is also the reason why considerably more speech by politicians (the study focused on spontaneous speech) was analyzed than speech by television presenters (spontaneous and non-spontaneous speech). All the selected speakers are well-known media or political personalities, are Slovenian native speakers, have a university degree in a social science field, were born between 1941 and 1970, mostly live and work in Ljubljana, spent their childhood and teenage years in various places around Slovenia, have no speech defects, and segment their speech normally in a neutral and unemotional speech situation (for more details on the material and speakers, see Huber, 2017).

The pauses in the audio material analyzed were first identified auditorily (the author of the article first listened to the recordings and manually tagged places where pauses in speech were detected), after which they were examined (confirmed, excluded, or added) and measured using the Praat program, where in addition to a detailed acoustic or phonetic analysis of the pauses (the final analysis took into account pauses at least 50 ms long²) speech transcription and segmentation were also carried

² Here, the research presented in Sabol and Zimmermann (1978) is primarily relied on, with certain adaptations. In comparison with their division, this study does not tag pauses shorter than 50 ms, and the threshold level for auditory perception of pauses is traditionally defined at 200 to 250 ms. There are various theories on how long an acoustic break in speech should be for listeners to even perceive the pause (anywhere from 0 to 100 ms, 200 ms, and 250 ms, and up to 2 s). The most frequent threshold value of perceiving silent pauses is between 200 and 250 ms (Bakran, 1996; Campione & Vérinos, 2002; Horga

out. In interpreting the results obtained through computer measurement, use was also made of some other intralinguistic features (e.g. text-phonetic characteristics, such as the speed of speech and sentence stress) as well as extralinguistic ones, such as televised images, which can also show nonverbal parts of communication (e.g. mimicking, gesticulating, etc.).

This article conceives of pauses as an indispensable acoustic and/or semantic break in the flow of speech, which means that they are not necessarily conditioned by silence or empty, but can be filled with a wide range of sounds, autosemantic or synsemantic words, and other (non)verbal elements. Like other prosodic or text-phonetic characteristics (sentence stress, intonation, register, speech tempo, and tone; see Toporišič, 1976), they are considered an important marker and organizer of speech, and various methodological approaches can be used to analyze them. Thus, pauses can be examined in relation to punctuation, typical locations or distribution in speech, their role in speech, structural elements, duration, frequency in speech, and syllable length, in comparison to other (text-) phonetic characteristics, such as intonation, sentence stress, and speech tempo, and, in terms of nonverbal elements, (non)spontaneous and stylistically (un)marked speech, (non)professional speakers, the speaker's sex and social status, (un)known information, (non)dialogism of communication, and so on.

Based on various methodological approaches mentioned in the previous paragraph, the first part of the study developed a specific methodology adapted to the research goal to study pauses in terms of their role in speech (see Table 1). Based on the assumption that both politicians and TV presenters segment text primarily due to their physiological needs (breathing), the hypothesis put forward also suggested that the physiological role of pausing predominates with both politicians and TV presenters, and that in terms of cognitive or communicative pauses both politicians and TV presenters most often interrupt their speech to look for the right formulations and to plan syntactic speech structures.

& Mukić, 2000; Viola & Madureira, 2008; Zellner, 1994), even though on the one hand listeners can also perceive pauses even shorter than that, but on the other they do not even perceive pauses longer than these values. Horga and Mukić (2000) argue that this points to the multilayered nature of this prosodic characteristic, which can be observed and studied not only as a psychological abstraction defined only in the physiological sense (i.e. through silence or a break in the flow of speech), but also via the syntactic structure of uttering and drawing out segments.

Table 1. The roles of pauses in speech: abbreviations and descriptions
Tablica 1. Uloge stanki u govoru: kratice i opisi

Role / Uloga	Features / Karakteristike
Physiological role / Fiziološka uloga (PR)	Respiratory pauses / Stanke disanja (PRRe); e.g. <i>je pa to šlo vse zelo hitro [PRRe] ti dogodki v Sloveniji</i> 'this however all came to pass very fast [PRRe] these events in Slovenia', <i>SpkrPm3³</i> , Text 2 Reflex pauses, such as coughing, sneezing, laughing, and swallowing pauses / Stanke zbog kašljanja, kihanja, smijeha, gutanja (PRR); e.g. <i>po dolgem obdobju vladanja [SWALLOWING] nastopi trenutek prenove</i> 'after a long period in power [SWALLOWING] there was time for reform', <i>SpkrPm5</i> , Text 3
Cognitive or communicative role / Kognitivna ili komunikacijska uloga (CR)	Pauses as a result of searching for the right formulation and planning the syntactic structure of speech (repeating the same words, drawn-out schwa (<i>uh</i>) sounds) and other sounds, the speaker not yet being completely sure what to say next) / Stanke zbog traženja odgovarajućih formulacija i planiranja sintaktičke strukture govora, npr. ponavljanje istih riječi, produživanje poluglasnika i drugih glasova; govornik nije potpuno siguran što će u nastavku govora reći (CRSP); e.g. <i>kaj lahko [əə; CRSP] rečete na to</i> 'what can you [<i>uh</i> ; CRSP] say to this', <i>SpkrJf6</i> , Text 3 Pauses due to inappropriate planning of speech (false starts of words or longer language units that speakers go on to correct or add to) / Stanke zbog neodgovarajućega misaonog planiranja govora, npr. krivi počeci riječi i dužih jezičnih jedinica koje u nastavku govornici ispravljaju ili nadopunjavaju (CRIP); e.g. <i>pa velikokrat bli okrcani da smo šli [predrobno; CRIP] prepodrobno</i>

³ Abbreviations / Objašnjenje kratica: Spkr = male/female speaker / govornici/govornice; P = male/female politician / političar/političarka; J = male/female journalist/presenter / novinar/ka odn. voditelj/ica; M = male / muški, f = female / ženski; individual numbers 1–22 indicate individual speakers / brojkama 1–22 označeni su pojedini govornici. PRRe = physiological role of respiration, PRR = physiological role of a reflex, CRSP = cognitive role of searching/planning, CRIP = cognitive role of inappropriate planning, CRURo = cognitive role of unsuccessful role switching, CRUD = cognitive role of unsuccessful delimitation, CRURe = cognitive role of unsuccessful response, CRE = cognitive role of emphasis, CRH = cognitive role of hesitation. The author is aware that it is not possible to assert with certainty that, for example, all physiological pauses tagged in the corpus in fact belong to this category because characteristics that essentially point to a physiological pause may also be of cognitive origin. It is also necessary to add that a particular structure of a filled pause may appear as part of several different roles of pauses; for example, a schwa is found not only in the role of "pauses as a result of searching for the right formulation and planning the syntactic structure of speech," but also in the role of "pauses due to inappropriate planning of speech", and so on.

'and we were often scolded for having gone [into too much detail; CRIP] into far too much detail', *SpkrJf8*, Text 4

Pauses due to speakers' (un)successful role switching in a dialog, including in simultaneous speech of two or more speakers / Stanke zbog (ne)uspješne zamjene uloge govornika u dijalogu, kao i zbog istovremenoga govora dvaju ili više govornika (CRURo); e.g. *zgodila ta zgodba [CRURo] torej takšno možnost* 'this story happened [CRURo], that is, we got this opportunity', *SpkrJf8* and *SpkrPf7*, Text 4

Pauses resulting from delimiting (segmenting) the flow of speech (between words and longer language units; the speaker knows what to say next) / Stanke zbog segmentiranja govornog tijeka, npr. između riječi i većih jezičnih jedinica; govornik zna što će u nastavku reći (CRUD); e.g. *da tu vzpostavmo mednarodno [CRUD] pravno [CRUD] pomoč* 'to establish international [CRUD] legal [CRUD] assistance here', *SpkrPf7*, Text 4

Pauses as a reaction to another speaker interrupting the current speaker's speech / Stanke kao reakcija na intervenciju sugovornika u govoru trenutnoga govornika (CRURe); e.g. *prej izkoriščena [PRRe]* 'used before' [PRRe] (*SpkrPf7*) *ni bila* 'was not' (*SpkrJf8*) *vsekakor [CRURe] vsekakor moram reč* 'and by all means [CRURe] by all means I have to say', *SpkrPf7*, Text 4

Pauses emphasizing or highlighting the importance of what follows or what has already been said, but not every emphasis behind the pause is the result of that pause / Stanke zbog isticanja, davanja važnosti nastavku govora ili već rečenome; no, svako isticanje iza stanke nije zbog same stanke (CRE); e.g. *velik [CRE] projekt* 'big [CRE] project', *SpkrPm10*, Text 5

Hesitation pauses / Stanke oklijevanja (CRH); e.g. *eni vam učitajo [CRH] da ste rdeči* 'some reproach you with [CRH] being red', *SpkrJm2*, Text 1

Pauses were divided into two basic categories (i.e. the physiological and cognitive or communicative roles), which were divided into further subcategories. In addition, a specific pause can have several different physiological and cognitive/communicative roles at the same time: hence the presumed predominating role or roles (perhaps two or three)⁴ of a selected pause were most often tagged in the corpus, even though the

⁴ In defining the predominant role or roles for a particular pause, the following measures were used: taking into account context and the television image (mimicking, gestures, etc.), familiarity with the speaker (well-known media speakers were analyzed), and a uniform approach by the researcher throughout the study (the roles in the entire corpus were defined by the author of the article). This ensured relative relations between the individual roles of pauses (therefore it is not the concrete percentage

fact is that the same pause can often perform several roles at once. At this stage of the research, the structure of pauses was not important – that is, whether a specific pause was empty or filled⁵ – because they were treated as equivalent. Likewise, with pauses that perform several roles it is also irrelevant in what order individual roles are written (and appear in speech), which means that from the perspective of the study conducted it was completely irrelevant whether the order of components of a pause analyzed was PRRe + CRSP or CRSP + PRRe, and so on.

The second part of the study analyzed pauses from the perspective of their structural composition. Just like in exploring the roles of pauses in speech, in this part of the research pauses were divided into two main categories: *silent* and *filled* pauses. Silent pauses were not further divided, whereas filled pauses were divided into the following subcategories and sub-subcategories: schwa, drawn-out sounds, various repetitions, false starts, simultaneous speech, and so on (see Table 2). Structurally, pauses can be *pure* or *non-composite* – that is, silent (SPa)⁶ or filled (FPa) – or *composite* – that is, composed of a silent pause and one or more filled structural units (SPa + FPa). Composite (silent-filled or filled-silent) pauses are conceived as a single break in the speech chain, which includes silence (SPa) and at least one filled pause structure, such as a drawn-out schwa (SLS), or repeating words (SRW). A silent pause (SPa) is thus an indispensable element of a composite pause and is, for example, followed by the drawn-out schwa (SLS) and a repeated word (SRW) within the same break in the flow of speech. With regard to composite pauses, it is irrelevant in what order individual (silent and/or filled) elements are written (or appear in speech), which means that from the perspective of the study conducted it was completely irrelevant whether the order of components of a pause analyzed was SPa + SLS or SLS + SPa

of the occurrence of individual types of pauses that is important, but the relationship between the individual roles of pauses).

⁵ For more on silent/empty/unfilled, filled, and "silent-filled" pauses, see also the following paragraph and section 2.2. In identifying the number of pauses or words that appear between two silent and/or filled pauses, the words spoken as part of simultaneous speech and all forms of filled pauses (repetitions, false starts, etc.) were eliminated. Simultaneous speech and other forms of filled pauses were thus understood as equivalent to silent pauses.

⁶ Abbreviations: SPa = silent pause, FPa = filled pause, SLS = structure with long (drawn-out) schwa, SRW = structure with repeating words, SS = structure with schwa, SDoS = structure with drawn-out sounds, SRep = structure with repetition, SFS = structure with false starts, SSS = structure with simultaneous speech, SOF = structure with other filler, SNE = structure with nonverbal event, SLSO = structure with long (drawn-out) other sounds, SRS = structure with repeating syllables, SRWC = structure with repeating word combinations, SRSU = structure with repeating longer syntactic units, SFSWR = structure with false starts without repetition, SFSR = structure with false starts with repetition.

because they were treated completely equally. In addition, at this stage it was also irrelevant what role individual pauses performed in speech because all roles were treated equally.

Table 2. The structures of pauses: abbreviations and descriptions

Tablica 2. Struktura stanki: kratice i opisi

Structure / Struktura	Description / Opis
Silent pauses / Prazne stanke (SPa); e.g. <i>bil bi zelo samouščen [SPa] če bi trdil kaj drugega</i> 'I'd be very self-complacent [SPa] to claim otherwise', <i>SpkrPm3</i> , Text 2	
Filled pauses / Pune stanke (FPa)	Schwa / Poluglasnik (SS); e.g. <i>pravzaprav [ə] napisala</i> 'actually [ub] wrote', <i>SpkrJm6</i> , Text 3
	Drawn-out sounds / Produživanje (SDoS)
	The schwa / Poluglasnika (SLS); e.g. <i>poglejmo [əə] javnost naj se spomni</i> 'let's see [ub] the public should remember', <i>SpkrJf8</i> , Text 4
	Other sounds / Drugih glasova (SLSO); e.g. <i>ne vem mogoče [mmm] <u>ma</u>l celo</i> 'I don't know [mmm] <u>ma</u> ybe or even', <i>SpkrPf14</i> , Text 7
Repeating / Ponavljanje (SRep)	Syllables / Slogova (SRS); e.g. <i>pa vendarle [ne] <u>ne</u>kako</i> 'but nonetheless [so] <u>so</u> mehow', <i>SpkrJf15</i> , Text 7
	Words / Riječi (SRW); e.g. <i>ampak hotla sem <u>eno</u> [eno] stvar</i> 'but I wanted to say <u>one</u> [one] thing', <i>SpkrPf20</i> , Text 10
	Word combinations / Sintagmi (SRWC); e.g. <i>z <u>neko</u> [z neko] etiko</i> ' <u>with certain</u> [with certain] ethics', <i>SpkrPf1</i> , Text 1
	Longer syntactic units (clauses, sentences, etc.) / Duljih sintaktičkih jedinica (rečenice, iskazi i sl.) (SRSU); there was no such example in the corpus
False starts / Krivi počeci (SFS)	Without subsequently repeating parts of a false start / Bez ponavljanja dijelova krivih početaka u nastavku govora (SFSWR); e.g. <i>čepnav [je blo] sem takoj vidla da je</i> 'although [it was] I immediately saw that it', <i>SpkrPf14</i> , Text 7
	With subsequently repeated parts of a false start / Ponavljanje dijelova krivih početaka u nastavku govora

(SFSR); e.g. *vaša recimo politična opcija si [žəž] želi seveda* 'your let's say political option [wawa] wants of course', *SpkrJm11*, Text 5

Simultaneous speech / Istovremeni govor (SSS); e.g. *državo* 'the country' (*SpkrPfl*) and *ja* 'yes' (*SpkrJm2*), Text 1

Nonverbal communication elements or other fillers, such as *mhm, əm 'um'; aja, ne, a ne?* 'Right?' / Neverbalna komunikacijska sredstva ili druge čestice i nefonemski glasnici, tj. *mhm, əm, aja, ne, a ne?* (SOF); e.g. *ker igra [əəm] pravzaprav* 'because it plays [um] actually', *SpkrPfl*, Text 1

Nonverbal events, such as sighs, laughter, coughing, sneezing, and swallowing / Neverbalni događaji kao udisaj, smijeh, kašljanje, kihanje, gutanje (SNE), e.g. *ker včasih je [LAUGHTER] nekdo drug uporablu* 'because sometimes [LAUGHTER] someone else used', *SpkrPm12*, Text 6

5. RESEARCH RESULTS AND DISCUSSION

The results of the research are first presented from the perspective of the roles that pauses play in speech, and the second part presents the results from the perspective of their structural composition.

5.1. First part of the research: The roles of pauses

Table 3 presents the results of analyzing the occurrence of various roles of pauses inside the corpus, including data on the occurrence (number and percentage) of pauses in the main role categories – that is, the physiological role (PR), the cognitive or communicative role (CR), and the physiological-communicative role (PR + CR) – and the data on the number of words spoken between two pauses and the duration of pauses broken down by various groups of speakers (male and female politicians and presenters). The analysis included 16,629 spoken words (11,411 male and female politicians and 5,218 male and female presenters) and 4,479 silent, filled, or "silent-filled" (both silence and filled structures – e.g. a drawn-out sound – occur as part of one interruption in the speech flow or as part of one pause; see section 4, last paragraph) pauses longer than 50 ms, and the average duration of all 4,479 pauses analyzed in the corpus was 382.4 ms. The results show that male and female politicians tend to segment their speech with pauses more often than male and female presenters (every 3.59 words versus every 4.02 words), and that on average the pauses made by male and female politicians are somewhat shorter (375.9 ms) than those of

male and female presenters (398.1 ms). Male presenters tend to speak with the fewest pauses (they make a pause every 4.14 words), whereas female politicians tend to speak with the most pauses, using pauses more frequently than all other categories of speakers (they make a pause every 3.46 words). Even if all results are aggregated by sex, it can be established that male speakers make fewer pauses (every 3.85 words) than female speakers (every 3.57 words), and that both sexes together segment their speech every 3.71 words. It was interesting to compare the duration of pauses by sex because the ones made by male speakers were nearly 115 ms longer (437.6 ms) on average than those made by female speakers (322.8 ms).⁷

Table 3. The roles of pauses in speech: results

Tablica 3. Uloge stanki u govoru: rezultati

Speaker / Govornik	Role / Uloga							Words between pauses / Riječi između stanki (N)	Pause duration / Trajanje stanki (ms)
	PR		CR		PR + CR		Total / Ukupno		
	N	%	N	%	N	%	N		
Male and female politicians / Političari i političarke									
Pm	285	17.8	1,064	66.5	251	15.7	1,600	3.72	429.6
Pf	402	25.4	978	61.8	202	12.8	1,582	3.46	321.6
Pm + Pf	687	21.6	2,042	64.2	453	14.2	3,182	3.59	375.9
Male and female presenters / Voditelji i voditeljice									
Jm	89	12.3	545	75.5	88	12.2	722	4.14	455.3
Jf	93	16.2	407	70.8	75	13.0	575	3.88	326.3
Jm + Jf	182	14.0	952	73.4	163	12.6	1,297	4.02	398.1
Male and female politicians and presenters / Političari i političarke, voditelji i voditeljice									
Pm + Jm	374	16.1	1,609	69.3	339	14.6	2,322	3.85	437.6
Pf + Jf	495	22.9	1,385	64.2	277	12.8	2,157	3.57	322.8
P + J	869	19.4	2,994	66.8	616	13.8	4,479	3.71	382.4

⁷ The author is aware of the research shortcomings (e.g. a relatively small sample of material analyzed and the absence of suitable statistical analyses), and so as part of this analysis one cannot speak about absolute values but can permit random statistical deviations. This is the first analysis of pauses in Slovenian media speech, which will have to be built upon in the future with a greater quantity of material analyzed and more precise statistical analysis.

Hence in the entire corpus, 4,479 pauses were tagged and analyzed, of which 869 or 19.4% were physiological (PR), 2,994 or 66.8% were communicative (CR), and 616 or 13.8% were physiological-communicative (PR + CR). Communicative pauses predominate, which applies to all the speakers analyzed in the corpus. The least predominant role of communicative pauses was recorded with the politician *SpkrPm5* (46.5%, PR 33.5% and PR + CR 20.0%), whereas they predominated the most in the speech of presenters *SpkrJm6+13* (80.9%), especially in one of the two talk shows that the speaker *SpkrJm13* appeared on (i.e. 84.3%). This finding refutes the first part of the research hypothesis, according to which physiological pauses predominate in the speech of both male and female politicians and TV presenters. In contrast, the results confirm the second part of the hypothesis, according to which respiratory pauses predominate among the physiological pauses. In terms of individual roles within the two main categories, respiratory pauses (PRRe) predominate with all speakers in the physiological role category (856 pauses out of a total of 869), whereas the cognitive/communicative role category is dominated by pauses resulting from searching for the right formulation and planning the syntactic structure of speech (CRSP; 1,314 of 2,994), and pauses resulting from delimiting (segmenting) the flow of speech (CRUD; 1,247 of 2,994). In the mixed PR + CR category, respiratory pauses and pauses resulting from searching for the right formulation and planning the syntactic structure of speech (PRRe + CRSP) predominate with all speakers (559 of 616). This finding confirms the second hypothesis that, among cognitive or communicative pauses, both male and female politicians and TV presenters primarily make pauses resulting from searching for the right formulation and planning the syntactic structure of speech. Among communicative pauses, 141 pauses that emphasize or highlight the importance of what follows or what has already been said (CRE) were recorded out of the total of 2,994 in addition to 120 pauses due to speakers' (un)successful role switching in a dialog (CRURo) and 89 pauses due to inappropriate planning of speech (CRIP).

In terms of sex and various roles of pauses, there are minor differences in the ratios of individual categories, whereas the order of pause occurrence is identical with both male and female politicians and TV presenters (CR – PR – PR + CR): male speakers: 69.3% CR, 16.1% PR, and 14.6% PR + CR (male politicians: 66.5% CR, 17.8% PR, and 15.7% PR + CR; male presenters: 75.5% CR, 12.3% PR, and 12.2%

PR + CR) and female speakers: 64.2% CR, 22.9% PR, and 12.8% PR + CR (female politicians: 61.8% CR, 25.4% PR, and 12.8% PR + CR; female presenters: 70.8% CR, 16.2% PR, and 13.0% PR + CR). It is especially interesting that on average male and female presenters make more communicative pauses than male and female politicians (73.4% versus 64.2%). Physiological pauses account for four-fifths of this 9.2% difference (male and female presenters 14.0%, male and female politicians 21.6%) and mixed PR + CR pauses account for the remaining fifth (male and female presenters 12.6%, male and female politicians 14.2%). In terms of individual speakers, 46.5% (*SpkrPm5*) or 54.4% (*SpkrPm5+16*) to 84.3% (*SpkrJm13*) or 80.9% (*SpkrJm6+13*) communicative pauses (CR) were recorded, followed by 6.7% (*SpkrPm21*) or 9.7% (*SpkrPm10+21*) to 32.0% (*SpkrPfl14*) or 27.5% (*SpkrPfl+14*) physiological pauses (PR) and 5.0% (*SpkrPfl7*) or 8.9% (*SpkrPfl7+20*) to 21.9% (*SpkrPm3*) or 19.2% (*SpkrPm3+12*) mixed PR + CR pauses. As already established, more communicative pauses on average are used by male and female presenters, whereas on average more physiological pauses are used by male and female politicians (21.6% versus 14.0% compared to male and female presenters). This may suggest that when searching for the right formulation male and female politicians are simply silent or make a respiratory pause, even though one would not be necessary yet, whereas in that same situation male and female presenters seek to combine silence with various drawn-out sounds (for more on this, see section 4). Perhaps TV presenters are also more aware than politicians that the medium in question (i.e. TV or radio to an even greater extent) does not tolerate silence and (overly) frequent inhaling while searching for appropriate speech structures.

5.2. Second part of the research: The structure of pauses

Table 4 presents the results of the analysis (percentage by sex and category of the speakers: male and female politicians, male and female presenters) separately for silent pauses, individual types of filled pauses (the schwa and various drawn-out sounds, repetitions, and other filled structures), and in terms of combining silent pauses and individual filled structures (the schwa and various drawn-out sounds, repetitions, and other filled structures). Within individual groups of structures, the total results for all speakers in an individual structure are provided in addition to the total results within individual groups of structures (SPa, FPa, and SPa + FPa).

Table 4. The structures of pauses: results
Tablica 4. Struktura stanki: rezultati

		Structure / Struktura								
		FPa (%)				SPa + FPa (%)				
		SS +		Other /	Total /	SPa + SS +		SPa +	Total /	Total /
Speaker /	SPa (%)	SDoS	SRep	Drugi	Ukupno	SDoS	SRep	Drugi	Ukupno	Ukupno
Govornik	SPa (%)	SDoS	SRep	FPa	FPa	SDoS	SRep	FPa	SPa + FPa	(N)
Male and female politicians / Političari i političarke										
Pm	65.9	9.4	0.2	3.5	13.1	17.6	0.3	3.1	21.0	1,600
Pf	75.4	4.9	0.7	3.1	8.7	11.4	0.8	3.7	15.9	1,582
Pm + Pf	70.6	7.2	0.4	3.3	10.9	14.5	0.5	3.5	18.5	3,182
Male and female presenters / Voditelji i voditeljice										
Jm	66.1	7.8	1.8	8.3	17.9	12.6	0.7	2.7	16.0	722
Jf	71.7	5.6	0.5	3.8	9.9	15.5	0.9	2.0	18.4	575
Jm + Jf	68.5	6.8	1.2	6.3	14.3	13.9	0.8	2.5	17.2	1,297
Male and female politicians and presenters / Političari i političarke, voditelji i voditeljice										
Pm + Jm	66.0	8.9	0.7	5.0	14.6	16.0	0.4	3.0	19.4	2,322
Pf + Jf	74.4	5.1	0.6	3.3	9.0	12.5	0.8	3.3	16.6	2,157
P + J	70.0	7.1	0.7	4.1	11.9	14.3	0.6	3.2	18.1	4,479

More than two-thirds of all pauses in the corpus (i.e. 3,137 or 70.0% out of 4,479) were silent or non-vocalized (SPa). Silent pauses predominate with both male and female politicians (70.6%) and male and female presenters (68.5%). Women (74.4%) tend to use them slightly more frequently than men (66.0%), which is especially evident with male politicians (65.9%) and female politicians (75.4%) and somewhat less with male presenters (66.1%) and female presenters (71.7%). Thus when pausing women tend to be silent more frequently or make more silent pauses than men, whereas male speakers more frequently resort to drawn-out sounds, repeating words, and so on. It is interesting that with men silent pauses are significantly (i.e. on average 87.6 ms) longer than with women (301.7 ms versus 214.1 ms). Men thus tend to more rarely segment their speech with silent pauses, but, when they do decide to use them, their silent pauses are significantly longer than those used by women. With regard to individual speakers, the use of silent pauses ranges between 49.8% (*SpkrPm21*) and 95.7% (*SpkrPm16*) with male and female politicians, and between 43.5% (*SpkrJm6*) and 93.1% (*SpkrJm19*) with male and female presenters.

The second most frequent type used (810 or 18.1%) is the "silent-filled" composite structures of the type SPa + FPa.⁸ They are used in a very similar percentage by both male and female politicians (18.5%) as well as male and female presenters (17.2%). Similar to silent pauses, here, too, the difference is more significant between male politicians (21.0%) and female politicians (15.9%) than between male presenters (16.0%) and female presenters (18.4%). Overall, composite pauses are slightly more common among male politicians and male presenters (19.4%) than female politicians and female presenters (16.6%). With regard to individual speakers analyzed, *SpkrPm16* (3.3%), *SpkrJm19* (5.0%), and *SpkrPf20* (89.9%) stand out in terms of the low percentage of composite pauses used, whereas with all other speakers the use recorded was over 10.0%, reaching up to 31.0% (*SpkrPm3*). Among composite pauses, by far the most silent pauses are used in combination with various drawn-out sounds (in Table 4 these combinations are indicated with SPa + SS + SDoS); their percentage is 14.3% (of 18.1% of all composite pauses in the corpus), with pauses composed of silent pauses and a drawn-out schwa being the predominant type. This type of composite pause predominates with all speakers; among the politicians they are slightly more common among men (17.6%) than women (11.4%), whereas their total average among both male and female politicians is 14.5%. Exactly the opposite tendency was recorded with TV presenters, where this type of pause is slightly more common among women (15.5%) than men (12.6%), with their total average among both male and female TV presenters being 13.9%. In the entire corpus, a slightly higher percentage of composite pauses of the type SPa + SS + SDoS was observed with male speakers (16.0% compared to 12.5% recorded among women). The percentage recorded with individual speakers ranged from 3.0% (*SpkrPm16*) to 22.6% (*SpkrPm21*). Among other composite pauses, another 1.0% were only accounted for by the types SPa + SFS (1.0%) and SPa + SS + SDoS + SFS (1.1%), whereas the remaining types (SPa + SRep, SPa + SS + SDoS + SRep, etc.) only accounted for 0.3% to 0.6% in the entire corpus. With regard to individual speakers, a deviation was recorded with speaker *SpkrJm2*, for whom a relatively frequent use of composite pauses of the type SPa + other FPa (8.3%) was typical; this type includes false starts, simultaneous speech, nonverbal communication, nonverbal events, and various combinations of filled pauses.

⁸ In terms of frequency, the order SPa – SPa + FPa – FPa is switched around (SPa – FPa – SPa + FPa) only with five speakers (*SpkrPm21*, *SpkrPfl*, *SpkrJm2*, *SpkrJm6*, *SpkrJm13*) of the total of twenty-two.

Filled pauses (FPa) proved to be the least common (11.9%), and they were mainly used by men (14.6% compared to 9.0% recorded among women). The difference is greater with male presenters (17.9%) and female presenters (9.9%), and smaller with male politicians (13.1%) and female politicians (8.7%). On average, they tend to be more frequently used by male and female presenters (14.3%), and less by male and female politicians (10.9%). The fewest filled pauses were used by male politician *SpkrPm16* (1.0%) and male presenter *SpkrJm19* (1.9%), whereas they were used most frequently by male presenters *SpkrJm6* (32.6%) and *SpkrJm2* (30.0%). Among filled pauses, by far the most common were various drawn-out sounds (7.1%), especially the schwa (in 222 cases out of 316). Drawn-out sounds are more common among men (male politicians 9.4%, male presenters 7.8%) than women (female politicians 4.9%, female presenters 5.6%). With regard to individual speakers, speakers *SpkrPm16* (0.3%) and *SpkrJm19* (0.6%) stand out with a low percentage and speakers *SpkrPm10+21* (18.0%) and *SpkrJm6+13* (17.5%) stand out with an above-average use. Among filled pauses, composite structures are also relatively common (2.6%), whereas all other categories account for only 0.7% (e.g. various repetitions) and 0.8%. With individual speakers, a deviation in using simultaneous speech was observed with speakers *SpkrJm2* (18.3%) and *SpkrPfl* (5.1%), and a deviation in using false starts was noted with speakers *SpkrJm4* (6.4%) and *SpkrJf8* (3.6%). In terms of mixed structures of filled pauses, male presenter *SpkrJm6+13* stands out with 8.2%.

With both filled pauses (7.1%) and composite "silent-filled" pauses (14.3%), structures with drawn-out sounds predominate, whereas structures with repetitions are relatively few (0.7% in FPa and 0.6% in SPa + FPa). Both findings only partially confirm the third hypothesis that various repetitions and drawn-out language units predominate among filled pauses with both politicians and TV presenters. This hypothesis can only be confirmed with regard to the drawn-out sounds, whereas a relatively frequent use of various repetitions cannot be confirmed for politicians or TV presenters.

6. CONCLUSION

The study presented in this paper explored pauses from the perspective of their roles in speech and their structural composition using a sample of fifteen politicians and TV presenters and a corpus of ten political talk shows broadcast on TV Slovenia with

a total duration of over two hours. Based on the methodological approaches established abroad, a special research methodology adapted to the goal of the study was designed and three hypotheses were formulated and tested on the material selected. The research findings show that on average empty or silent pauses, which perform the primarily (but not exclusively) physiological function of breathing, predominate among the speakers analyzed. Cognitive or communicative pauses (and not physiological ones) are most common on average, and speakers most often interrupt their speech to look for the right formulation and to plan syntactic structures and the segmentation of the flow of speech. Drawn-out schwas (*uh* sounds) occur most often among filled and "silent-filled" pauses with all the speakers analyzed. It should be noted that the results obtained could be influenced by a variety of linguistic and extralinguistic characteristics or completely personal traits of an individual speaker, such as the speed and manner of speaking, age, experiences, and emotional state.

The analysis of pauses presented in this paper, which is part of broader research on Slovenian media speech (cf. Huber, 2013), yields many new findings in Slovenian text phonetics, but there is still room for further research. Hence, with regard to pauses, it would also make sense to explore the relationship between the length of syllables and the duration of pauses, their correlation with speech tempo and intonation, and so on. Ultimately, it would also be interesting to examine the connection between pauses and nonverbal communication, and the results could additionally be confirmed through perception tests conducted on a larger number of individuals.

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Uloge i struktura stanki u slovenskom medijskom govoru

Sažetak

U radu je riječ o stankama koje se proučavaju s obzirom na uloge koje imaju u govoru, kao i s obzirom na njihovu strukturu. Stanke se smatraju nepogrešivim zvučnim i/ili značenjskim, odnosno sadržajnim prekidom govornog toka i uvrštavaju se među značajne označitelje i organizatore govora. Empirijsko istraživanje stanki napravljeno je na osnovi korpusa deset slovenskih televizijskih emisija, tj. u sklopu autentičnog i uglavnom spontanoga govora odabranih političara i voditelja televizijskih emisija u ukupnom trajanju od oko dva sata (tri političara i tri političarke te pet voditelja i četiri voditeljice televizijskih emisija).

Rezultati pokazuju da u korpusu prevladavaju prazne stanke (SPa) koje se često povezuju s fiziološkom ulogom disanja, što međutim ne znači da SPa nailazimo isključivo u toj ulozi. Od 4 479 analiziranih stanki samo je 19,4 % onih koje imaju samo fiziološku ulogu (PR) i čak 66,8 % stanki koje imaju samo komunikacijsku ulogu (CR); osim njih, dobiveno je i 14,8 % fiziološko-komunikacijskih stanki (PR + CR).

Među pojedinim ulogama kod kategorije PR u prosjeku prevladavaju stanke zbog disanja (PRRe 98,5 %), kod kategorije CR prevladavaju stanke zbog traženja odgovarajućih formulacija i planiranja sintaktičkih struktura govora (CRSP 43,9 %) te stanke zbog segmentiranja govornog toka (CRUD 41,6 %), dok kod miješane kategorije PR + CR prevladavaju stanke zbog disanja i traženja odgovarajućih formulacija te planiranja sintaktičkih struktura govora (PRRe + CRSP 90,7 %). Voditelji/voditeljice naprave u prosjeku više komunikacijskih stanki nego političari/političarke (73,4 % prema 64,2 %). S jedne strane, više komunikacijskih stanki javlja se kod voditelja/voditeljica, a s druge je strane u prosjeku više fizioloških stanki kod političara/političarki, iz čega bi se moglo zaključiti da političari i političarke, tražeći odgovarajuće formulacije, jednostavno šute, odnosno naprave stanku zbog udisaja, iako on u toj situaciji još nije neophodan, dok voditelji i voditeljice, tražeći odgovarajuće formulacije i planirajući odgovarajuće sintaktičke strukture govora, pokušavaju tišinu kombinirati prije svega s različitim produživanjem glasova. Oni su, vjerojatno, više od

političara svjesni da medij (televizija) ne podnosi predugačke tišine između traženja odgovarajućih struktura.

Oko 70 % svih stanki u korpusu je praznih (SPa). Govornice nešto češće upotrebljavaju SPa nego govornici (74,4 % prema 66,0 %), što znači da govornice prilikom stanki najčešće šute, dok govornici češće produžuju glasove, ponavljaju riječi i sl. Na drugom su mjestu po čestotnosti sastavljene strukture SPa + FPa (u cijelom ih korpusu ima 18,1 %), među kojima se najčešće pojavljuje SPa u kombinaciji s različitim vrstama produživanja (i to u 14,3 % od 18,1 % svih sastavljenih stanki u korpusu), a prevladavaju stanke koje su sastavljene iz SPa i produženog poluglasnika. Najmanje je stanki u korpusu punih (FPa), i to 11,9 %, češće su kod govornika (14,6 %) nego kod govornica (9 %). Najčešće su pune stanke s produženim glasovima (7,1 %), riječ je prije svega o produženom poluglasniku (70,3 % svih produženja).

Ključne riječi: tekstna fonetika, stanaka, uloga stanki, struktura stanki, medijski govor

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Changes in the self-reported frequency of use of the Fiuman dialect: Implications for language maintenance

Summary

This paper reports the results of a study that investigates changes in the self-reported frequency of use of the Fiuman dialect, a regional minority Romance language spoken in the Croatian city of Rijeka and its surroundings, with respect to its hearing, speaking, reading, and writing both in the present and the past. The data was collected by means of a questionnaire containing closed and open-ended questions administered to 244 Fiuman speakers, between the ages of 14 and 89 years old. The results show a decrease in the spoken use of Fiuman today in comparison to the past, but also an increase in its written use, among younger speakers. The participants list numerous reasons for the decrease in spoken use, the main ones being related to a reduction in the number of Fiuman speakers and demographic changes in the city. The increase in written use relates primarily to communication on social networks, in text messaging and via e-mail, as well as to communication at work. The results point to the importance of modern technology and the new media for the maintenance of minority languages.

Key words: Fiuman dialect, minority language, frequency of use, new media, language maintenance

1. INTRODUCTION

The Fiuman dialect is a regional minority Romance language spoken in and around the Croatian city of Rijeka. It is a member of the Venetan family of Italian dialects, spoken predominantly in the Italian region of Veneto. It is similar to the dialect spoken in Trieste (It. *il triestino*) and the Italian dialects spoken in the Croatian regions of Istria (It. *l'istrovneto*) and Dalmatia (It. *il veneto dalmata*). Evidence suggests that it has been spoken in Rijeka since at least the 15th century. Its origins are not clear: according to one theory, it developed from the vernacular Latin spoken in the city area by the Romanised Illyric tribes (Bató, 1933/1999; A. Depoli, 1913; G. Depoli, 1928/1999; Gigante, 1913), and according to another, it was gradually introduced into the city by Venetian merchants owing to the fact that Venetian was a *lingua franca* in the Adriatic at the time (Bidwell, 1967; Folea, 1968–1970; Rošić, 2002; Spicijarić Paškvan, 2015; Spicijarić Paškvan & Crnić Novosel, 2014). Throughout its history, Fiuman has come into close contact with other languages and dialects spoken in the city area, namely Latin, German, Hungarian, French, Turkish, standard Italian, and standard Croatian as well as the Chakavian dialect of the Croatian language, influences of which are evident in its present form (for their analyses, see e.g. Blečić & Tamaro, 2015; Gottardi, 2007; Lukežić, 1993; Spicijarić Paškvan, 2018). Today, Fiuman is primarily in contact with Italian and Croatian, Italian having the status of a minority and Croatian of the majority and official language in the city of Rijeka. Fiuman and standard Italian differ at almost all levels of linguistic analysis (see Bratulić, Đurđulov, Blečić, & Kraš, 2015, for an overview of these differences), but are genetically related and mutually intelligible. On the other hand, Fiuman and Croatian are structurally and genetically different and mutually unintelligible. Standard Italian, albeit a minority language itself today, has a different relation to Croatian than Fiuman. Being the official language of Italian minority nurseries and schools, as well as other Italian minority institutions in Rijeka, its position is much more stable. The continued use of Fiuman is thus dependant to an extent on sustaining the diglossic relationship with both standard Italian and Croatian.

In this paper, we explore Fiuman speakers' self-reported frequency of use of the dialect in the present and the past with respect to different forms of use – hearing, speaking, reading, and writing. The aim is to tap changes in the frequency of use in order to make tentative predictions about the maintenance of Fiuman. The phenomenon of language maintenance (LM) can be defined as "a situation in which

a speaker, a group of speakers, and/or a speech community continue to use their language in some or all spheres of life despite competition with the dominant or majority language to become the main/sole language in all spheres" (Pauwels, 2004, p. 719). The reverse phenomenon, that LM is often studied in relationship with, is language shift (LS), which is defined as "the change (gradual or not) by a speaker, a group of speakers, and/or a speech community from the dominant use of one language in almost all spheres of life to the dominant use of another language in almost all spheres of life" (Pauwels, 2004, p. 719). In situations of language contact between two (or more) speech communities of unequal status, such as that of Fiuman, Croatian, and Italian in Rijeka, either LM or LS can occur.

The results of previous studies into the maintenance of Fiuman are contradictory (see section 3). Lukežić (1993, 2008) and Rošić (2002) consider Fiuman endangered, while Crnić Novosel & Spicijarić Paškvan (2014) and Spicijarić Paškvan & Crnić Novosel (2014) argue that there is a tendency towards its maintenance as evidenced by intergenerational transmission and the existence of proficient young speakers. The aim of the present study is to provide further insight into the maintenance of Fiuman by exploring possible changes in the self-reported frequency of use of Fiuman across the lifespan of its present speakers and possible intergenerational differences in the frequency of the present use of Fiuman. It is part of a larger study on Fiuman maintenance, other aspects of which are reported in Plešković, Drljača Margić, Medved, and Kraš (2019) and Plešković (2019).

2. FACTORS CONTRIBUTING TO LANGUAGE MAINTENANCE AND LANGUAGE SHIFT

The phenomena of LM and LS have been studied in two types of speech communities – migrant communities (e.g. Clyne, 1982; Edwards, 1998; Fishman et al., 1966; Wei, 1994) and regional minority communities (e.g. Dorian, 1981; Gal, 1979). The speech community of the Fiuman dialect is an example of the latter.

According to Pauwels (2016), factors contributing to LM or LS include individual features (e.g. age, gender, education, social class, race/ethnicity, language attitudes), minority group features (e.g. the number of minority language speakers, settlement patterns, linguistic/cultural resemblance to the majority group) and majority group features (e.g. attitudes towards the minority language/culture, the

existence of laws/policies supporting linguistic variety). These factors interact in complex ways and operate somewhat differently in each speech community. The outcome of such an interaction is not easy to predict, but scholars contend that the use and transmission of a minority language within the family, along with positive attitudes of its speakers towards it and supportive institutional and educational policies, are the main prerequisites for LM.

In fact, intergenerational transmission and the use of the minority language among all generations of speakers are viewed as fundamental factors contributing to LM (e.g. Arriagada, 2005; Fishman, 1991; Lao, 2004; Luo & Wiseman, 2000; Park & Sarkar, 2007; Pauwels, 2005; Soehl 2016). Intergenerational transmission is a precondition for language use and language proficiency, both of which are necessary for LM (Fase, Koen, & Kroon, 1992). Without intergenerational transmission, neither positive attitudes nor institutional and educational support are likely to prevent LS.

Communities whose speakers have positive attitudes towards their language as a symbol of group identity are much more likely to maintain it (Pauwels, 2004). Positive attitudes might lead to an increase in language proficiency (e.g. Young & Gardner, 1990). It has been shown that parents' positive attitudes towards the minority language have positive effects on children's minority language proficiency (e.g. Guardado, 2002; Lao, 2004; Phinney, Romero, Nava, & Huang, 2001). They also reinforce children's ethnic and cultural identity as minority members and strengthen their self-esteem (e.g. Lee, 2002; Sofu, 2009; Zhang & Slaughter-Defoe, 2009).

Institutional support includes laws and policies that approve, and activities that encourage, the use of the minority language. Minority communities, sports organisations, cultural institutions, clubs, churches and similar play a crucial role in LM because they enable speakers to see the usefulness of using their language outside the family context (e.g. Komondouros & McEntee-Atalianis, 2007; Park & Sarkar, 2007). Educational support gives the opportunity for learning the minority language and may promote its use among all community members (e.g. Ehala, 2009; Fishman, 1991; Gorter & Cenoz, 2012; Kroon, 1990; Pauwels, 2005). Nevertheless, without speakers' positive attitudes towards the minority language, institutional support is not very effective (Ehala, 2009; Pauwels, 2005; Yağmur, 2004).

3. THE STATUS, PRESENCE AND MAINTENANCE OF THE FIUMAN DIALECT

Until the beginning of the 20th century, Rijeka belonged to different states, the official languages of which varied; however, the languages of common use in the city were Fiuman and Chakavian. Throughout the 20th century, political, ideological, demographic, economical, and linguistic changes in Rijeka led to a decline in the number of Fiuman speakers (Lukežić, 1993). Most importantly, after World War II, Rijeka became part of the Social Federal Republic of Yugoslavia, and the official language changed from Italian (which was the official language in Rijeka between the two world wars) to Croatian (called *hrvatskosrpski* at the time). This was accompanied by the adoption of the communist and socialist ideology as well as by economic difficulties, which led to the emigration of part of the city's population. It has been estimated that more than 30 thousand speakers of Fiuman left the city after World War II (Giuricin & Scotti, 2006; Žerjavić, 1993), while mainly Slavic speakers immigrated to it (Crnić Novosel & Spicijarić Paškvan, 2015). In the 21st century, the emigration trend has continued (Lajić & Klempić Bogadi, 2012), and has been accompanied by a negative birth rate (Croatian Bureau of Statistics, 2018).

There is no official record of the current number of Fiuman speakers. Today's Fiuman speakers are mostly bilingual or multilingual – in addition to Fiuman, they speak Croatian and/or Italian and other languages or dialects. In most cases, they state that Fiuman is their mother tongue (Crnić Novosel & Spicijarić Paškvan, 2014) and declare themselves as members of the Italian national minority. For this reason, the census data pertaining to the Italian minority members and Italian mother tongue speakers in Croatia and the city of Rijeka are relevant. According to the Croatian Bureau of Statistics (2001, 2011), the number of Italian minority members (19,636 or 0.44% vs. 17,807 or 0.42%) and Italian mother tongue speakers (20,521 or 0.46% vs. 18,573 or 0.43%) in Croatia is decreasing as well as the number of Italian minority members (2,763 or 1.92% vs. 2,445 or 1.90%) and Italian mother tongue speakers (2,745 or 1.91% vs. 2,276 or 1.77%) in Rijeka.

The Italian minority in Rijeka enjoys legal rights to use the language and script in public domains as well as organise and engage in the relevant educational and cultural activities, which are granted to them by the Constitution of the Republic of Croatia (2014) and the *Statut Grada Rijeke* [Statute of the City of Rijeka] (2016). Standard Italian has

the official status in Italian minority nurseries, schools, and other institutions in Rijeka, including the Italian Community of Rijeka (It. *Comunità degli Italiani di Fiume*), the Italian National Theatre (It. *Dramma Italiano*) and the EDIT publishing house. It is also the official language of the *La Voce del Popolo* daily newspaper and several editions of daily news on the *Radio Rijeka/Radio Fiume* local radio station. As for Fiuman, to our knowledge, it is scarcely present in education and the media. However, during the 20th century, columns and articles in Fiuman were published in *La Voce del Popolo*, while texts in Fiuman appeared in *Panorama*, *La Tore* and *La Batana* (magazines for the Italian national minority in Croatia). In addition, *Radio Rijeka/Radio Fiume* used to broadcast a satirical programme in Fiuman called *Tomaso ficanaso*. An exception to the general trend are several texts in Fiuman written by Laura Marchig which appeared on the Internet (see <https://www.rijekadanas.com/?s=la+scartaza>) in the column called *La Scartaza* in 2018. Literary works in Fiuman, although existent, are also very scarce. The most important ones are collected in Pužar (1999). There are also books of poetry *Joze Fiumane* by Egidio Milinovich, and *Rime de Fiume* and *I Sfoghi del Cor* by Mario Schittar/Zuande la Marsecia as well as the collection of short satirical and critical texts published in *La Voce del Popolo* and *La Tore* called *Storia e Ciacole de un Fiuman Patoco* by Ettore Mazzieri.

As for the maintenance of Fiuman, Lukežić (1993, 2008) argues that Fiuman is in danger of extinction. She attributes its endangered status to two factors: first, the prestige of standard Italian and its influence on Fiuman between the two world wars, and second, the ideological and political changes in Rijeka after World War II, which caused the marginalisation of Fiuman speakers and their retreat to peripheral city enclaves. According to Lukežić (2008), Fiuman is no longer a dialect, used by the whole city population, but a sociolect, used by a specific social group, within which it is "atrophying and decaying" (Lukežić, 1993, p. 37). Rošić (2002, p. 11) also claims that the loss of Fiuman is inevitable as it is regularly and fluently used only by seventy- and eighty-year-olds, while younger speakers opt for standard Italian. The above studies, however, do not provide any empirical evidence to support the claims of LS.

Crnić Novosel & Spicijarić Paškvan (2014, 2015) and Spicijarić Paškvan & Crnić Novosel (2014), on the other hand, argue that there are necessary prerequisites for LM despite the fact that Fiuman is used exclusively in private domains and

informal situations¹, and primarily in oral communication. Based on empirical evidence obtained via a questionnaire, they claim that there is intergenerational transmission of the dialect and the existence of proficient young speakers in the Fiuman speech community. Crnić Novosel and Spicijarić Paškvan (2014) report that 86% of their respondents aged up to 35 years use Fiuman in everyday communication. The respondents also proved to be aware of the importance of dialect transmission, albeit younger ones less so than the older, and of the need to additionally protect Fiuman in order to preserve it. They also stated that the community members' attitudes towards Fiuman and its maintenance were positive. In addition, the respondents described Fiuman as equally valuable as the others city dialects and characterised it as the main trait of their identity. Nevertheless, Spicijarić Paškvan and Crnić Novosel (2014) state that Fiuman speakers are no longer concentrated within the nucleus of the city, but are scattered across the whole city area, which decreases the possibility of using the dialect in the immediate neighbourhood.

Previous studies on Fiuman did not look into the diachronic perspective of its use, which is of considerable importance for LM, as a decrease in use is an indicator of LS. They also did not seek to determine its frequency of use with respect to hearing, speaking, reading, and writing, which would give a more detailed picture of its use. This study aims to fill this gap.

4. THE STUDY

4.1. Research questions

The following research questions were addressed in the study:

1. Has the frequency of hearing Fiuman, speaking in Fiuman, reading in Fiuman, and writing in Fiuman changed over time for different age groups of speakers? If yes, what are the possible reasons for this change?
2. Is there a difference between different age groups of speakers in terms of the frequency of hearing Fiuman, speaking in Fiuman, reading in Fiuman, and writing in Fiuman in the present?

¹ Drljača Margjić, Kraš, and Smiljanić (2015) state that Fiuman is also used in informal communication at work in the Italian minority institutions.

4.2. Participants

A total of 244 Fiuman speakers, aged 14 to 89 years, participated in the study. They were divided into six age groups: adolescents (aged 14–18 years), younger adults (aged 19–32 years), pre-middle-aged adults (aged 33–46 years), middle-aged adults (aged 47–60 years), post-middle-aged adults (aged 61–74 years) and older adults (aged 75 years and above). The distribution of the participants according to age is shown in Table 1.

Table 1. Distribution of participants according to age

Tablica 1. Podjela ispitanika prema dobi

Age group (N) / Dobna skupina (N)						Total (N) / Ukupno (N)
Adolescents / 14 – 18 godina	Younger adults / 19 – 32 godine	Pre-middle- aged adults / 33 – 46 godina	Middle-aged adults / 47 – 60 godina	Post-middle- aged adults / 61 – 74 godine	Older adults / 75+ godina	
37 (15.16%)	42 (17.21%)	35 (14.34%)	55 (22.54%)	46 (18.85%)	29 (11.86%)	244

Participants of both genders took part in the study – 170 (70%) female and 74 (30%) male. A total of 229 participants (94%) were born and lived in Rijeka and its surroundings at the time of their participation in the study. The majority spoke Fiuman, standard Italian, Croatian and one or more additional languages. Some also spoke Chakavian. A total of 219 participants (90%) had been exposed to Fiuman from birth, and 167 participants (68%) considered Fiuman their mother tongue. Some reported having more than one mother tongue.

Due to practical constraints, the participants' knowledge of Fiuman was not formally tested; rather, the participants (who all declared themselves as speakers of Fiuman) self-rated their proficiency in Fiuman according to different language skills (listening, reading, speaking, and writing) on a five-point Likert scale with the following values: 1 ("none"), 2 ("elementary"), 3 ("good"), 4 ("very good"), and 5 ("excellent"). Median values of the participants' self-ratings of their proficiency in Fiuman, according to language skills and age groups, are given in Table 2.

Table 2. Participants' self-ratings of their proficiency in Fiuman according to language skills and age groups

Tablica 2. Samoprocjena ispitanika o vlastitom poznavanju fijumanskog prema jezičnim vještinama i dobnim skupinama

Language skill / Jezična vještina	Age group / Dobna skupina											
	Adolescents / 14 – 18 godina		Younger adults / 19 – 32 godine		Pre-middle-aged adults / 33 – 46 godina		Middle-aged adults / 47 – 60 godina		Post-middle-aged adults / 61 – 74 godine		Older adults / 75+ godina	
	Mdn	IQR	Mdn	IQR	Mdn	IQR	Mdn	IQR	Mdn	IQR	Mdn	IQR
Hearing / Slušanje	4	1	5	1	5	0	5	0	5	1	5	0
Speaking / Govorenje	4	2	5	1	5	1	5	1	5	1	5	1
Reading / Čitanje	4	2	5	1	5	1	5	1	5	1	5	0
Writing / Pisanje	3	2	4	2	4	2	5	1	4.5	2	5	1

It can be observed that all age groups self-rated their proficiency in Fiuman rather highly. However, a general increase of self-ratings can be observed with age. Also, in most of the age groups (i.e. all apart from middle-aged and older adults), writing is self-rated lower than the other language skills.

4.3. Materials and procedure

Part of the Fiuman Dialect Questionnaire (Bratulić, Drljača Margić, & Kraš, 2017) was used to collect the data. A closed-ended question required participants to rate their frequency of use of Fiuman on a five-point Likert scale with respect to hearing², speaking, reading, and writing, in the present and the past. "The past" referred to "the childhood" in the version of the questionnaire administered to adolescents and "the childhood and adolescence" in the version of the questionnaire administered to all other age groups. The values on the scale were 1 ("never"), 2 ("rarely"), 3

² Note that "hearing" does not refer to the conscious activity of listening but rather an unconscious act of perceiving sound. This term was used in both language versions of the questionnaire.

("sometimes"), 4 ("often"), and 5 ("every day"). An open-ended question asked participants to explain why their frequency of use of Fiuman changed, if it did, in the course of time. Information about the participants' language profile and sociodemographic background was also collected. The participants could choose between the Italian and the Croatian version of the questionnaire; only 22 participants chose the Croatian version. The questionnaire was completed on paper.

4.4. Results

Median values of the participants' ratings of the frequency of hearing Fiuman, and speaking, reading, and writing in Fiuman in the present, for different age groups, are shown in Table 3.

Table 3. Participants' ratings of the frequency of their use of Fiuman in the present according to forms of use and age groups

Tablica 3. Procjena ispitanika o učestalosti vlastite uporabe fijumanskog u sadašnjosti prema oblicima uporabe i dobnim skupinama

Form of use / Uporaba	Age group / Dobna skupina											
	Adolescents / 14 – 18 godina		Younger adults / 19 – 32 godine		Pre-middle- aged adults / 33 – 46 godina		Middle-aged adults / 47 – 60 godina		Post-middle- aged adults / 61 – 74 godine		Older adults / 75+ godina	
	Mdn	IQR	Mdn	IQR	Mdn	IQR	Mdn	IQR	Mdn	IQR	Mdn	IQR
Hearing / Slušanje	4	2	4	2	4	2	4	2	4	2	4	2
Speaking / Govorenje	4	3	4	2	4	2	5	1	4	2	5	1
Reading / Čitanje	2	1	2	1	2	1	2	2	2	1	3	3
Writing / Pisanje	1	1	2	2	2	1	2	2	2	2	2	3

Similarly, Table 4 shows median values of the participants' ratings of the frequency of hearing Fiuman, and speaking, reading, and writing in Fiuman in the past, for different age groups.

Table 4. Participants' ratings of the frequency of their use of Fiuman in the past according to forms of use and age groups

Tablica 4. Procjena ispitanika o učestalosti vlastite uporabe fijumanskog u prošlosti prema oblicima uporabe i dobnim skupinama

Form of use / Uporaba	Age group (Mdn) / Dobna skupina (Mdn)											
	Adolescents / 14 – 18 godina		Younger adults / 19 – 32 godine		Pre-middle- aged adults / 33 – 46 godina		Middle-aged adults / 47 – 60 godina		Post-middle- aged adults / 61 – 74 godine		Older adults / 75+ godina	
	Mdn	IQR	Mdn	IQR	Mdn	IQR	Mdn	IQR	Mdn	IQR	Mdn	IQR
Hearing / Slušanje	4	2	4	1	5	1	5	0	5	0	5	0
Speaking / Govorenje	4	3	5	2	5	1	5	0	5	0	5	0
Reading / Čitanje	1	1	2	2	2	2	3	2	2	3	3	3
Writing / Pisanje	1	1	2	2	2	2	2	2	2	3	2	3

A comparison of Tables 3 and 4 shows that, overall, (a) the frequency of hearing Fiuman and speaking in it is higher than the frequency of reading and writing in Fiuman, both in the present and the past, for all age groups, (b) the frequency of use of Fiuman is higher in the past than in the present, for all age groups except the adolescents, and (c) the frequency of use of Fiuman increases with the age of the participants, both in the present and the past, the exception to this being post-middle-aged adults compared to middle-aged adults. The significance of these trends was explored by means of inferential statistics. We used non-parametric tests because the data we had obtained using the Likert scale is ordinal and, as such, does not permit the use of parametric tests (see e.g. Field, 2009, for the position that Likert scale data is ordinal and the assumptions of parametric tests).

To answer the first research question (Has the frequency of hearing Fiuman, speaking in Fiuman, reading in Fiuman, and writing in Fiuman changed over time for different age groups of speakers?), we compared the participants' ratings of the frequency of hearing Fiuman in the present and the past, speaking in it in the present and the past, reading in it in the present and the past, and writing in it in the present and the past by means of the Wilcoxon signed-rank test, for each age group separately.

The tests revealed that adolescents write in Fiuman more often now than they did in the past ($z = -2.154, p < .05, r = -0.25$), that younger adults heard Fiuman more often in the past than they do now ($z = -2.006, p < .05, r = -0.22$), that pre-middle-aged adults heard Fiuman ($z = -3.171, p < .01, r = -0.38$) and, to some extent, spoke in it ($z = -1.960, p = .055, r = -0.23$) more often in the past than they do now, but that, similar to adolescents, they write in it more often now than they did in the past ($z = -2.728, p < .01, r = -0.33$). Middle-aged adults heard Fiuman ($z = -4.566, p < .001, r = -0.44$) and spoke in it ($z = -2.822, p < .01, r = -0.27$) more often in the past than they do now, the same being true for post-middle-aged adults (hearing: $z = -4.559, p < .001, r = -0.48$; speaking: $z = -3.280, p < .001, r = -0.34$). Finally, older adults heard Fiuman more often in the past than they do now ($z = -2.641, p < .01, r = -0.35$). Overall, the results suggest that the frequency of hearing Fiuman has decreased over time, followed by the frequency of speaking in it. In contrast, the frequency of writing in Fiuman has increased over time, especially among adolescents and pre-middle-aged adults.

When asked about the reasons for the possible change in the frequency of use of Fiuman, around a third of the participants (36%) did not answer this question. Of the remaining two thirds (64%), 70% reported a decrease in the use of Fiuman, listing the following reasons (illustrated with the participants' statements in brackets): mortality rate and speaker age (20%) ("Unfortunately, my parents and neighbours to whom I spoke in Fiuman are dead", "I am 71, and my parents and most of the other family members to whom I spoke Fiuman are dead", "I have fewer opportunities to meet my schoolmates and thus fewer opportunities to speak Fiuman"), a decline in the number of speakers (18%) ("We live in a city where the number of Fiuman speakers is steadily decreasing", "Fewer and fewer people speak the Fiuman dialect, particularly the youngest ones"), the impact of the dominant language (17%) ("Although I always speak Fiuman at home, as I started attending university and working later, Croatian has been the language I have most frequently used", "Recently I haven't spoken Fiuman because I am always in the company of people the majority of whom speak Croatian"), a move out of the city or quarter (13%) ("The change, although small, took place after I finished grammar school and moved to Italy and started being exposed to other dialects as a result"), intermarriages (8%) ("After I got married, because my husband does not speak it", "The use of Fiuman decreased when I married. My wife does not speak it"), emigration after World War II (6%) ("In 1947, after the exodus of the Fiumans", "The change occurred after the war because

the Fiumans left for Italy. There are few of us left. You can hear the Italian language less and less. It's a shame"), the influence of standard Italian (4%) ("Now I use Fiuman less frequently because I have to speak standard Italian at university (in Italy)", "Because at school and university, I speak only Italian"), immigration of Slavic population (3%) ("The arrival of new populations", "Speaking in the Fiuman dialect has become less frequent nowadays because the people – the citizens – that surround us do not have our roots, so we, the Fiumans, are being treated as strangers, second-rate persons. All of this has happened in the course of the years because the number of Fiumans is diminishing") and several other reasons, such as lack of intergenerational transmission ("It occurs when parents do not transmit the dialect to their offspring, grandparents to their grandchildren etc.") and media content in Fiuman ("Changed as a result of the suppression of the columns in Fiuman [*Voce – Pepi Fritola, Soto la Tore, Radio Babe*] and radio transmissions [*Tomaso Ficanaso*]", "The impossibility of reading/listening").

A total of 15% of the participants who answered the question reported an increase in the use of Fiuman, attributing this to the communication in Fiuman at work (50%) ("When I was a child, I spoke Fiuman only within the family [I attended Croatian-medium schools]. Now I speak it within the family and at work") and the use of modern technology and the new media (50%) ("When I contact my colleagues by e-mail, we often communicate in Fiuman", "Nowadays I use it more frequently [in reading and writing] thanks to the media", "In the new millenium, Facebook replaced the great majority of daily contacts. So you speak more often online than in person", "The change happened only within the written domain. In childhood and adolescence, I didn't use to write it because communication was exclusively oral. Now with e-mail and mobile phones, I sometimes write it"). They also mention a stronger feeling of belonging to the language/national minority (16%) ("Having reached a certain age, I felt a sense of belonging to the Fiumans more deeply, so I started using the Fiuman dialect more") and a change in their life environment (12%) ("I learned Fiuman when I married", "After adolescence, having lived in Rijeka since the age of 18, I have always spoken Fiuman with my co-nationals"). The remaining 15% of the participants who answered the question did not report a change in the frequency of use of Fiuman.

As for the second question (Is there a difference between different age groups of speakers in terms of the frequency of hearing Fiuman, speaking in Fiuman, reading in Fiuman, and writing in Fiuman in the present?), we compared the age groups' ratings

of the frequency of hearing Fiuman, and speaking, reading, and writing in it in the present by means of the Kruskal-Wallis test. We obtained a statistically significant difference between the age groups for all forms of use, apart from hearing Fiuman. More precisely, the differences were obtained for speaking ($H(5) = 15.450$, $p < .001$), reading ($H(5) = 23.884$, $p < .001$) and writing ($H(5) = 14.482$, $p < .05$) in Fiuman. We used Mann-Whitney tests to discover which age groups differed from each other. All effects are reported at an α of .003 due to the application of a Bonferroni correction. Adolescents were found to speak ($U = 656.000$, $z = -3.123$, $p < .01$, $r = -0.20$), read ($U = 655.000$, $z = -3.021$, $p < .01$, $r = -0.19$) and write ($U = 589.000$, $z = -3.547$, $p < .001$, $r = -0.23$) in Fiuman less often than middle-aged-adults and to read in it less often than older adults ($U = 232.000$, $z = -4.060$, $p < .001$, $r = -0.26$). Younger adults were also found to read in Fiuman less often than older adults ($U = 342.500$, $z = -3.211$, $p < .01$, $r = -0.21$). Therefore, when it comes to the present use of Fiuman, younger speakers were found to use Fiuman less often than the older ones, in the spoken, but especially in the written form.

5. DISCUSSION

If we consider the differences between the use of Fiuman in the present and the past, addressed by the first research question, two opposing tendencies can be observed. On the one hand, speakers of all age groups, except adolescents, speak in Fiuman and/or hear it less frequently now than they did in the past. These results can be explained by a decrease in the number of Fiuman speakers, reported by Lukežić (1993) and the participants. Besides, according to the participants, older speakers outnumber younger ones in the Fiuman speech community, but their mobility and participation in the social life of the city are limited. An increase in the number of Slavic speakers in Rijeka and in mixed marriages also contribute to this. Only very rarely have mixed marriages led to an increase in the use of Fiuman, in the cases when Fiuman was acquired by the partner who had not spoken it previously. The participants also mention a more widespread use of Croatian and standard Italian in the present than in the past. Furthermore, the participants report that nowadays, Fiuman is primarily used in the private domain or in informal communication in the public domain (as also reported by Crnić Novosel & Spicijarić Paškvan, 2014, 2015; Drljača Margić et al., 2015; Lukežić, 1993, 2008; Spicijarić Paškvan & Crnić Novosel, 2014), whereas in the past, it was also used in the public domain (e.g. in shops, schools and playgrounds) and in

the media. Besides, Fiuman speakers no longer live close to each other in the core city area and have fewer opportunities to interact, as noted also by Spicijarić Paškvan and Crnić Novosel (2014).

On the other hand, there is an increase in the written use of Fiuman, especially among younger speakers (adolescents and pre-middle-aged adults), who use modern technology and the new media more than older speakers. The increase in writing pertains to communication on social networks, in text messaging and via e-mail, as well as to communication at work in the Italian minority institutions. Numerous studies have shown that the new media and modern technology have a great potential in LM, especially among adolescents and young adults. Jany (2017) states that the use of endangered minority languages in social media and on the Internet enables new generations to learn and use language, and therefore contribute to the success of reversing LS. She explains that the world modernises and adapts to new ways of communication, and new conditions for social and communicative exchanges emerge. In her words, "in a time when oral and written communication are converging, when written communication is assuming the communicative roles of traditionally oral communication, and when linguistic features of oral and written language are becoming more similar, it seems unavoidable to develop written representations of the otherwise oral languages" (Jany, 2017, p. 74). In the study on Low German, Reershemius (2017) finds the Internet potentially useful in making a minority language more visible and accessible. It provides effective methods of archiving language data and promoting teaching materials, can support standardisation efforts and helps diaspora speakers create online communities. In the case of Low German, speakers who were previously reluctant to write in their minority language have started using it on Facebook. Similarly, Fiuman has been promoted via several Facebook groups, as our participants report. Reershemius (2017, p. 45) states that "users get together in a linguistically and ideologically less regulated space for the purposes of entertainment, humour and the celebration of linguistic heritage and regional identity, and develop their own voice by transferring their bilingual practices from spoken language into a new form of writing in the Facebook group". Cru (2015) also reports that Yucatec Maya use Facebook as a non-institutional domain, characterised by non-standard language use, written language reflecting oral communication, language mixing, and borrowing. According to Pauwels (2005), content intended for children (e.g. picture books, audio and video materials, games) and adolescents (e.g. computer games, virtual playrooms, mobile phones and the Internet content) can

make the use of the minority language interesting and attractive and is not necessarily linked to the family environment.

The results have also revealed some differences between the age groups, tackled by the second research question. Despite an increase in writing in Fiuman, adolescents tend to speak, read and write in it less frequently than older speakers, similar to younger adults, who tend to read in it less often than the oldest speakers. Several reasons could be advanced for this. Firstly, younger speakers opt for other varieties, Croatian or standard Italian. For younger generations, especially adolescents, the language of the broader community is often more important than the family language (e.g. Soehl, 2016), and they abandon their mother tongue in an attempt to be accepted in society. The issue of language preference can also be related to the formation of the identity, a process which may not be completed in younger speakers, due to which the minority language loses ground to the majority one. According to Crnić Novosel and Spicijarić Paškvan (2014), Fiuman speakers gradually integrate in the other language communities in Rijeka and assume their identities. Furthermore, younger Fiuman speakers often attend Italian minority schools in Rijeka, where standard Italian is used in the classroom. In contrast to Fiuman, standard Italian creates opportunities for further education and moving to another environment, and improves job prospects.

The issue of language choice/preference and identity formation/acceptance is a natural consequence of maturation and conscious decisions (cf. Lee, 2002). The older participants state that, with an aroused feeling of belonging to the minority community, they started using Fiuman more often. Older generations are often seen as guardians of minority languages (Pauwels, 2005; Phinney et al., 2001; Sofu, 2009). The results of our study corroborate this as in many families Fiuman went out of use with the death of the oldest speakers. Previous studies also state that Fiuman is more frequently used among older speakers. In Crnić Novosel & Spicijarić Paškvan (2014) and Spicijarić Paškvan & Crnić Novosel (2015), the speakers of Fiuman aged 76 years or above, followed by those aged 36 to 75 years, reported using Fiuman more often than the speakers aged 17 to 35 years.

Overall, the results of our study suggest that in the case of Fiuman, there is a risk of LS, as the frequency of hearing Fiuman and speaking in it seems to have decreased across the lifespan of its present speakers and given that younger speakers tend to use it less often than older ones. However, there is also room for LM, primarily in relation to modern technology and the new media, due to which Fiuman is increasingly used

in writing, especially among younger speakers. However, the writing trend, which could potentially create a means of LM, should be complemented by other forms and different domains of use. At the moment, the use of Fiuman in the public domain is primarily related to informal communication among Fiuman speakers at work in the Italian minority institutions. For the maintenance of a minority language, the use in a broad range of different domains and involving a broad range of speakers is crucial. It is also important that the minority language receives coverage in the media, in the form of use in the broadcasting of radio and television programmes and in publishing newspapers and magazines. Although a minority language, especially a dialect as Fiuman is, can never function in a range of domains as wide as that in which the dominant language is employed, it can still find niches in which its usage is natural and necessary. The Fiuman community in Rijeka should take the opportunities offered by modern technology to increase the presence and visibility of Fiuman in the media and in different language domains. Complemented by the transmission and use of the dialect in the family as the primary prerequisites, these communication opportunities can increase the chance of its maintenance.

6. CONCLUSION

This questionnaire-based study discovered changes in the self-reported frequency of use of the Fiuman dialect in the present compared with the past: on the one hand, there appears to be a decrease in the spoken use of Fiuman, while on the other, the written use of Fiuman, primarily on social networks, in text messaging and via e-mail, seems to be on the rise. Some intergenerational differences in the current frequency of use of Fiuman were also revealed: younger speakers seem to be using Fiuman in both oral and written form less often than older ones. Such results suggest that LS, which might have already started among younger Fiuman speakers, can be reversed if additional efforts are invested in LM, for example if the potential of modern technology and the new media is exploited. However, given that the results of the study are based on self-reported rather than actual use of Fiuman, the predominantly subjective data presented here should be complemented by data obtained by more objective methods, such as corpus analyses. Also, to gain a more detailed insight into the reasons underlying the possible changes in the use of Fiuman among different generations of its speakers, the use of qualitative methods, primarily interviews, would be useful. Finally, given the complexity of the LM and LS phenomena, exploring other

aspects of the use of Fiuman, primarily the different domains of use, and other factors, such as intergenerational transmission, language attitudes, speaker motivation and institutional and educational support, is important for obtaining a deeper insight into the present status of Fiuman and making firmer predictions about its maintenance. The studies that are complementary to this one (Plešković, 2019; Plešković et al., 2019) aim at achieving this goal.

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Hrvatska

Promjene u samoiskazanoj učestalosti uporabe fijumanskog dijalekta: implikacije za očuvanje jezika

Sažetak

U radu se iznose rezultati istraživanja kojim se proučavaju promjene u učestalosti samoiskazane uporabe fijumanskog dijalekta, autohtonoga manjinskog romanskog idioma grada Rijeke i njegove okolice, u govoru, slušanju, čitanju i pisanju u sadašnjosti u odnosu na prošlost. Iako mu je podrijetlo nejasno, fijumanskim se dijalektom govori u Rijeci još od 15. stoljeća te se danas rabi prvenstveno u govoru, u privatnoj i neformalnoj komunikaciji. Službeni je jezik talijanskih manjinskih institucija u Rijeci standardni talijanski. Podaci su u istraživanju prikupljeni uz pomoć upitnika s pitanjima zatvorenog i otvorenog tipa, provedenog na uzorku od 244 govornika fijumanskog dijalekta u dobi od 14 do 89 godina, podijeljenog u šest dobnih skupina. Rezultati pokazuju općenitu tendenciju smanjenja govorne uporabe fijumanskog u sadašnjosti u odnosu na prošlost, ali istovremeno i povećanje učestalosti pisanja na fijumanskom, osobito među mlađim dobnim skupinama. Govornici navode različite razloge smanjenja uporabe, a kao najčešći ističu se: smanjenje broja govornika, demografske promjene u gradu i dominacija većinskog jezika. Učestalija uporaba fijumanskog uočena je u komunikaciji na radnom mjestu, s kolegama, na društvenim mrežama, u SMS-porukama i e-pošti, kao i u jačanju osjećaja pripadnosti nacionalnoj i jezičnoj manjini, koji se pojavljuje s godinama. Rezultati također pokazuju da mlađi govornici fijumanskog rabe taj dijalekt u govoru i pismu rjeđe od starijih govornika. Taj rezultat, kao i onaj koji se odnosi na smanjenje fijumanskog u govoru, upućuje na to da postoji opasnost od napuštanja tog dijalekta; s druge strane, porast pisane uporabe fijumanskog te korištenje novih tehnologija i medija pružaju mogućnosti za njegovo očuvanje.

Ključne riječi: fijumanski dijalekt, manjinski jezik, učestalost uporabe, novi mediji, očuvanje jezika

Prikaz

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Hrvatska

28. znanstveni skup Međunarodnog društva za forenzičku fonetiku i akustiku (IAFPA). Istanbul, Turska, od 14. do 17. srpnja 2019. godine

Dvadeset i osmi znanstveni skup Međunarodnog društva za forenzičku fonetiku i akustiku (IAFPA) održan je od 14. do 17. srpnja 2019. godine u Istanbulu, u konferencijskoj dvorani hotela WOW Istanbul. Skup je organiziralo Vijeće za forenzičku medicinu uz pomoć znanstvenog odbora IAFPA-e, tvrtke za digitalne forenzičke usluge Difose te tvrtke za digitalne forenzičke usluge EMT Electronics. Na skupu je održano 15 izlaganja te je prezentirano 18 postera. Sudionici su dolazili iz brojnih zemalja svijeta: Njemačke, Nizozemske, Kanade, Hrvatske, Srbije, Češke, Irana, Indije, Švicarske, Kine, Francuske, Švedske, Gruzije, Turske, a najveći broj izlagača bio je iz Ujedinjenog Kraljevstva.

U nedjelju, 14. srpnja u kasnim popodnevnim satima održan je prijem sudionika, a službeno otvaranje skupa započelo je 15. srpnja s početkom u 9 sati. Prva sesija izlaganja obuhvatila je tri predavanja. Prva skupina izlagača govorila je o doprinosu izvora i filtra karakterizaciji govornika u okviru Fantove teorije te je iznijela zaključke o značajnoj neovisnosti izvora i filtra pri karakterizaciji govornika. U drugom izlaganju prezentirana je promjena u prepoznavanju govornika na primjeru NFI-FRIDA – baze forenzički relevantnih govornih zapisa koji su simultano snimljeni različitim uređajima za snimanje. Izlagači su u radu primijenili i-vektorski i x-vektorski okvir pri automatskom prepoznavanju govornika. U posljednjem predavanju prve sesije obrađena je tematika utjecaja vikanja na uspješnost automatskog prepoznavanja govornika, naglašavajući pritom važnost ekstrinzičnih i intrinzičnih parametara pri prepoznavanju govornika.

U drugoj sesiji održana su četiri izlaganja. U prvom je predavanju obrađena dinamika indeksikalnih promjena u govoru. Rezultati predstavljenog istraživanja

pokazali su da veća varijabilnost fundamentalne frekvencije unutar govornika olakšava prepoznavanje govornika. Autori su također napomenuli da se dinamička obilježja glasa mogu kontrolirati primjenom različitih postavki fundamentalne frekvencije. Drugo je predavanje obradilo tematiku prijetvornoga govora i njegova utjecaja na slušno razlikovanje govornika. Rezultati su očekivano pokazali da je učinkovitost razlikovanja govornika manje uspješna kod prijetvornog negoli kod istinitoga govora te da bi u budućnosti bilo korisno ispitati konkretne akustičke karakteristike prijetvornoga govora kako bi se mogla objasniti priroda lošijeg prepoznavanja govornika. U trećem predavanju iznesen je pregled stvarnih slučajeva u tri forenzička govorna laboratorija (CFPA, NFI i RCMP) sa svrhom isticanja trendova i izazova unutar različitih organizacija i pravne nadležnosti. Posljednje predavanje druge sesije održao je Julien Plante-Hébert u koautorstvu s B. Jemel i V. Boucherom, čiji je rad izabran za najbolji studentski rad. Tema je predavanja bila prepoznavanje poznatih glasova iz neuralnih odgovora, a rezultati rada pokazali su da se pri prepoznavanju intimno poznatih glasova aktiviraju specifični neuralni odgovori.

Nakon ručka uslijedila su posljednja tri predavanja prvog dana skupa. Prvo je predavanje bilo na temu ispitivanja različitih artikulacijskih postavljanja korištenjem MRI-a te su u izlaganju prezentirani pilot rezultati za jednoga govornika. Drugo se predavanje bavilo relativnom važnosti vokala i obstruenata pri određivanju materinskog jezika kod kineskih, nizozemskih i američkih govornika engleskog jezika. Treće je predavanje održala Zdravka Biočina, izlagačica iz Hrvatske, s temom percepcije kod naivnih slušatelja. U istraživanju se, na primjeru govora otoka Brača, pokazalo da su izvorni govornici, iako naivni, uspješniji u prepoznavanju mjesnoga govora govornika koji im je bliskiji.

Nakon kratke stanke uslijedila je posterska sekcija sa sljedećih 12 tema: preliminarna analiza kvalitete glasa u zapadnojorkširskom govoru, pravila ponašanja u IAFPA radnoj skupini, razlike u vrijednostima formanata i fundamentalne frekvencije između govornika hrvatskog i srpskoga govora izlagačice iz Hrvatske Ive Bašić, zatim analiza fundamentalne frekvencije i vokalskih formanata u perzijskom na temelju dugotrajnih obilježja, projekt VoxCrim i forenzička usporedba glasova, usporedba alternativnih mjera govornog tempa, reflektiranje kasta kroz fonetska obilježja govora, unutargovornička varijabilnost dugotrajnih mjera fundamentalne frekvencije, automatska procjena dobi govornika kod govornika kurdskog, razlikovanje bilingvalnih govornika LTF metodom, promjene govornog ritma tijekom starenja i akustička te automatska verifikacijska analiza digitalnog i prirodnoga glasa.

Drugi je dan konferencije započeo pozvanim plenarnim izlaganjem Murata Nihata Arslana, stručnjaka forenzičke medicine, s temom analize uzoraka tragova krvi s osvrtom na znanstveni dokaz s mjesta zločina do suda. Svrha je predavanja bila raspraviti upotrebu Fryeovog testa i Daubert standarda u znanstvenim dokazima uzoraka tragova krvi. Nakon zanimljivoga plenarnog predavanja uslijedilo je predavanje o utjecaju izbora popratnih podataka na snagu dokaza. Rezultati su pokazali da je procjena omjera vjerojatnosti (LR) otporna na izbor približno usklađenih popratnih podataka, ali i da upotreba neusklađenih popratnih podataka i zvučnih baza može značajno utjecati na snagu dokaza.

Nakon kraće stanke uslijedila je druga sesija predavanja. Prvo je predavanje obradilo tematiku dugotrajne analize formantskih frekvencija u međujezičnoj forenzičkoj usporedbi glasova primjenom omjera vjerojatnosti. Rezultati istraživanja pokazali su da je LTF metoda nepouzdanija kod međujezičnih usporedbi govornika negoli kod usporedbe govornika unutar istog jezika. Sljedeće je izlaganje istaknulo važnost analiziranja sugovornika u slučajevima forenzičke usporedbe govornika s tezom da sugovornikov govor na stvarnoj audio i/ili vizualnoj snimci može utjecati na kriminalčev ili osumnjičenikov govor.

Nakon stanke za ručak uslijedila je druga i posljednja posterska sekcija, u kojoj je prezentirano šest tema: ispitivanje izvedbe iVocalise sustava na češkom i perzijskom jeziku s obzirom na različitu prilagodbu postavki, razlikovna snaga uzvika u forenzičkom prepoznavanju govornika, međujezična stabilnost razlikovne snage dugotrajnih formantskih distribucija na primjeru bilingvalnih govornika, slušno slične glasovne analize, stručno znanje fonetičara u stvarnim forenzičkim slučajevima te prepoznavanje i profiliranje govornika u GBR-ENG bazi podataka.

Posljednjeg, trećeg dana skupa održana su dva izlaganja. Prvim je predavanjem obrađena tematika automatskog prepoznavanja govornika unutar baza s više govornika. Pristup kliznih prozora pokazao se kao koristan alat pri automatskom prepoznavanju baza sastavljenih od dvaju govornika, a autori su iznijeli i rezultate analize provedene na forenzički relevantnoj FRIDA bazi podataka. Prof. Peter French potom je obavijestio sudionike konferencije o radu časopisa *The International Journal of Speech, Language and the Law* te o planovima za budućnost. Pozvao je izlagače na objavljivanje radova u časopisu i na sudjelovanje u radu časopisa u recenzentskim postupcima.

Osim predavanja i posterskih izlaganja, na konferenciji su održane i četiri besplatne te iznimno korisne radionice: "Utvrdjivanje vjerodostojnosti forenzičkih

prikaza", "Razbijanje lozinki", "Istraživanje samoubojstava na računalima" i "Mobilna forenzička istraga na pametnim telefonima povezana sa slučajevima prijetnje". Sve je radionice omogućio i osigurao Odbor za forenzičku medicinu.

Bogat znanstveni i stručni sadržaj konferencije upotpunila su društvena događanja, koja su nadmašila sva očekivanja sudionika. Na kraju prvog dana konferencije održana je svečana konferencijska večera na jahti. Vidjeli smo prekrasan dio istanbulske obale te uživali u čarobnom pogledu na Bospor. Drugog dana konferencije pogledali smo senzacionalne otomanske haremske plesove, tradicionalne turske i trbušne plesove u Hodjapasha kulturnom centru. Preostalo slobodno vrijeme sudionici skupa iskoristili su za obilazak bogate kulturne baštine Istanbula te uživanje u delicijama turske kuhinje. Spoj Istoka i Zapada sadržan je u sloganu samoga grada ("Where East meets West"), a ocrta se u svakom djeliću grada kroz žive, bučne, šarene, mirisne i kaotične doživljaje koji ga čine toliko privlačnom destinacijom. Za sudjelovanje u svim aktivnostima izvan konferencijskog centra (radionice, društvena događanja) bio je osiguran prijevoz, što je učinilo konferenciju još ugodnijom. Tradicionalno, IAFPA konferencija završila je fotografiranjem svih sudionika s organizatorima skupa ispred konferencijskog centra u kojem se skup održavao.

S obzirom na raznolikost tema unutar područja forenzičke fonetike te iznimno uspješnu organizaciju cijelog skupa (izlaganja, posterske sekcije, radionice, društvena događanja), organizatori zaslužuju posebne pohvale za organizaciju IAFPA konferencije te ugodnu radnu atmosferu, posebice organizatorica konferencije forenzička stručnjakinja i konzultantica za turski jezik Burcu Önder Gürpınar. Za 2020. godinu najavljena je 29. IAFPA konferencija koja će se održati u Marburgu u Njemačkoj. Veselimo joj se s visokim očekivanjima koje je postavila ovogodišnja konferencija.

Prikaz

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Hrvatska

Konferencija Komisije za fonetiku i fonologiju pri Međunarodnom slavističkom komitetu. Prag, Češka, od 26. do 27. rujna 2019. godine

Na Filozofskom fakultetu Karlovog sveučilišta u Pragu 26. i 27. rujna 2019. godine održana je Konferencija Komisije za fonetiku i fonologiju slavenskih jezika pri Međunarodnom slavističkom komitetu. Komisija za fonetiku i fonologiju slavenskih jezika jedna je od četrdesetak komisija Međunarodnoga slavističkog komiteta koja uobičajeno organizira po dvije konferencije između dvaju svjetskih slavističkih kongresa, kojih je organizator Komitet.

Komisija za fonetiku i fonologiju slavenskih jezika osnovana je 1968. godine te je u prvih 16 godina održano deset konferencija, od kojih je posljednja bila u Sarajevu 1987. godine. U tom su razdoblju predsjednici Komisije bili redom: Stojko Stojkov (1968–1969), Mięczysław Karaś (1970–1977), Milan Romportl (1978–1983) i Jiřina Novotná-Hůrková (1984–1993). Nakon konferencije u Sarajevu došlo je do prekida u radu Komisije do 1993., kada su njezine aktivnosti nastavljene konferencijom u Torunju (Poljska). Od tada su se na predsjedničkoj dužnosti u Komisiji izmijenili Ján Sabol s Filozofskog fakulteta u Košicama (Slovačka), Irena Sawicka s Filozofskog fakulteta u Torunju i Slavističkog instituta Poljske akademije znanosti u Varšavi (Poljska) i ponovno Ján Sabol, koji je na čelu Komisije i danas. Hrvatski član Komisije do konferencije u Sarajevu 1987. bio je Milan Moguš, a od 1993. Damir Horga. Na konferencijama su svojim radovima sudjelovali iz Hrvatske Marko Liker i Ines Carović, a 1997., kada je konferencija održana u Zagrebu, i veći broj hrvatskih fonetičara i fonologa. Od 1993. konferencije se održavaju uglavnom bijenalno pa su domaćini bili Poljska (Torunj i Ciechocinek), Slovačka (Prešov i Košice), Češka (Prag), Rusija (Moskva), Njemačka (Budišin), Slovenija (Ljubljana), Makedonija (Skoplje) i 1997. Hrvatska (Zagreb). Radovi s konferencija ponekad se objavljuju u zasebnim zbornicima (*Fónické javy v slovanských jazykoch*, Prešov, 2002; *Kapitoly z*

fonetiky a fonologie slovanských jazyků, Prag, 2005), a ponekad i u časopisima (npr. *Acta Universitatis Nicolai Copernici*, Torun; *Slavistična revija*, Ljubljana i *Govor*, Zagreb). Osim izlaganjima na konferencijama članovi Komisije sudjelovali su u izradi i publiciranju i nekih znanstvenih projekata: *Usporedba slavenskih jezika: Fonetika – fonologija*, ur. Irena Sawicka, Opole, 2007. i *Sandhi u slavenskim jezicima I i II*, ur. Anna Cychnerska i Irena Sawicka, Varšava, 2013. i 2016. U prvom je zborniku između opisa 13 slavenskih jezika objavljen opis fonološko-fonetskog sustava hrvatskog jezika Ive Škarića i Damira Horge, a u drugom je objavljen rad Damira Horge pod naslovom "Fonotaktika u hrvatskom". U tijeku je rad na makedonsko-poljskom projektu izrade fonetsko-fonološkog opisa makedonskog jezika, koji vode Irena Sawicka, Anna Cychnerska, Agata Trawińska s poljske strane te Veselinka Labroska i Branislav Gerazov s makedonske.

Iako je izbor tema koje se izlažu dosta širok, jedna je tema obavezna na svim konferencijama, a to su metodička i metodološka pitanja fonetskih i fonoloških istraživanja slavenskih jezika. Druge se teme odabiru tako da zahvate neko uže, ali istraživački aktualno fonetsko područje, pa je prirodno da su one različite za svaku pojedinu konferenciju. Za konferenciju u Pragu, osim obavezne prve teme, bile su predložene sljedeće uže teme: usporedna fonetika i fonologija slavenskih jezika, arealna lingvistika, dijakronijski i sinkronijski opis slavenskih jezika, slavenski jezici u medijima, trajanje i naglasak u slavenskim jezicima i eksperimentalno istraživanje fiziologije govora. Na konferenciji je održano 16 referata uz sudjelovanje 20-ak znanstvenika iz Bugarske, Češke, Hrvatske, Makedonije, Poljske i Slovačke te su istraživani jezici tih zemalja uz usporedno istraživanje nekih od slavenskih jezika. Primijenjene su različite istraživačke metode od teorijskog pristupa jeziku općenito, preko perceptivno prikupljenih podataka distribucije pojedinih govornih realizacija do primjene suvremenih eksperimentalnih fonetskih metoda kao što su artikulografija, ultrazvuk, akustička analiza govora i govorna tehnologija, koja uključuje strojnu analizu i sintezu govora.

Ján Sabol (Slovačka) je na temeljima svoje semantičke teorije jezika i dihotomnih karakteristika jezičnog znaka i njegovoga govornog ostvarenja, polazeći od ikoničko-simboličkog principa s jedne strane i principa arbitrarnosti s druge strane, raspravljao o svojstvima fonetskog takta i riječi i kvantitativnom odnosu linearnih, horizontalnih i sintagmatskih i asocijativnih, vertikalnih i paradigmatičkih svojstava govora, čime se ostvaruje kontinuiranost – diskontinuiranost govornog izraza te mnogostruke binarne opozije koje su u različitim odnosima u različitim komunikacijskim realizacijama

govora i jezika, kao što su motiviranost – nemotiviranost, varijantnost – invarijantnost, sukcesivnost – simultanost, segmentalnost – suprasegmentalnost, metaforičnost – metonimičnost i dr. Dimitar Popov i Velka Popova (Bugarska) govorili su o dvije teme. Dimitar Popov u svom je izlaganju govorio o tome na koji se način mnogobrojni fonetski parametri mogu upotrijebiti u "lingvističkoj personologiji" kako bi se dobio fonetski profil pojedinoga govornika kao mogući identifikacijski ključ za njegovo prepoznavanje i svrstavanje u određeni ideolekt, dobnu, spolnu skupinu i sl. U drugom zajedničkom izlaganju ovo dvoje autora raspravljalo je o multimodalnosti govornog signala i doprinosu vizualnog kanala otkrivanju smisla govorne poruke i njezine informacijske vrijednosti koja se pridodaje njezinom akustičkom sadržaju.

Tri su izlaganja bila posvećena pitanjima fonetike makedonskog jezika izrađene u okviru spomenutog makedonsko-poljskog projekta, u kojem će u dvotomnoj monografiji biti opisana fonologija i fonetika makedonskog jezika. Anna Cychnerska i Agata Trawińska (Poljska) opisale su fiziološke i akustičke karakteristike vokala /e/ u naglašenoj i nenaglašenoj poziciji u riječi i u različitim slogovnim pozicijama te usporedile njegovu suvremenu realizaciju s dosadašnjim opisima tog vokala. Irena Sawicka (Poljska) govorila je o mjestu naglasaka u makedonskom, u kojem je mjesto naglasaka stalno i na trećem slogu od kraja riječi, ali se u 20 % slučajeva naglasak ostvaruje na drugačijoj poziciji te su razmatrani faktori i različita fonetska i morfofonološka pravila koja djeluju na mjesto naglasaka u makedonskom jeziku. Konačno, Branislav Gerazov i Veselinka Labroska (Makedonija) prikazali su tipologiju intonacijskih obrazaca suvremenoga makedonskog jezika, koji su nosioci određenih gramatičkih značenja (npr. izjavne i upitne rečnice), ali i različitih emocionalnih sadržaja koji pridonose ili mijenjaju leksički sadržaj izričaja.

Iveta Bónová (Slovačka) je na longitudinalnom istraživanju razvoja govora u djece u dobi od 18 do 43 mjeseca pokazala na koji se način od univerzalnih zakonitosti razvoja govora na fonetsko-fonološkom planu ontogenetski razvija fonološka struktura konkretnog, u ovom slučaju slovačkog jezika.

Dva su izlaganja bila posvećena ortoepiji poljskog jezika. Magdalena Oswicka-Kondratowitz (Poljska) je na primjeru varijantnosti govorne realizacije određenih morfoloških oblika u suvremenom poljskom jeziku razmatrala pitanje razvoja ortoepske svjesnosti, osobito u javnom govoru i u govoru govornih profesionalaca, te je zaključila da je nužno proučavanje, poučavanje i uspostavljanje ortoepske norme poljskog jezika, dok je Tatiana Zinowjeva govorila o novim tendencijama

pojavljivanja slogotvornih sonantskih alofona u konsonantskim skupinama tipa -tr u poljskom govoru uspoređujući tu pojavu sa sličnim pojavama u ruskom, makedonskom i srpskom jeziku.

Julius Zimmermann i Eva Kiktova (Slovačka) bavili su se pitanjima govorne tehnologije pa je Zimmermann govorio o razvijanju algoritama za prepoznavanje rečenične intonacije na temelju intenzitetskih i tonских modulacija govora u slovačkom i o metodi razvijanja računalnog prepoznavanja i klasifikacije intonacijskih obrazaca, dok je Kiktova govorila o tome kako se na temelju frekvencijskih, vremenskih i intenzitetskih parametara govora može razviti strojna anticipacija i lokalizacija govornih jedinica, što je provjereno perceptivnim testovima slušatelja.

Anita Lorenz i Agata Trawińska (Poljska) su primjenom artikulografskog istraživanja verificirale akustičkim analizama ranije dobiven artikulacijski model izgovora glasnika /k/ u poljskom jeziku te su pokazale da je artikulografskim metodama moguće potvrditi taj akustički model. Zaključile su da je na temelju artikulografskih podataka moguće vjerno opisati izgovor pojedinih glasnika.

Pitanjima kontaktne lingvistike bavile su se Jitka Veroňková i Zdena Palková (Češka) istražujući koliko ostvarivanje razlike između dugih i kratkih vokala u češkom jeziku, kada ga govore govornici kojima je materinski jezik ruski, pridonosi osjećaju stranog akcenta. Ti se odnosi razmatraju u okviru općih spoznaja o psiholingvističkom kontaktu dvaju fonoloških i fonetskih sustava do kojeg dolazi u svijesti i izvedbi govornika kada uče neki strani jezik. Također je istraženo na koji način određene morfološke karakteristike riječi djeluju na ostvarivanje razlike u dužini vokala u češkom jeziku u govornika kojima je materinski ruski jezik.

Sudionici iz Hrvatske prezentirali su dva rada. Ines Carović, Damir Horga i Tena Žganec prikazali su rezultate arealnog istraživanja vokala ultrazvukom, u kojem su usporedili vokalski prostor i položaj jezika u izgovoru pojedinih vokala standardnoga hrvatskog i vokala donjomeđimurskoga govora kajkavskog dijalekta. Pokazali su da se ultrazvučnom metodom mogu dobiti pouzdani podaci o pozicijama pojedinih vokala u vokalskom prostoru i da je za sustav u kojem ima više vokala, kao što je donjomeđimurski govor s 12 vokala u odnosu na standard s pet vokala, potreban veći artikulacijski prostor za njihovu realizaciju i međusobno razlikovanje. U izlaganju Damira Horge i Ines Carović analiziran je asimilacijski utjecaj afrikata i frikativa na prethodni okluziv, kada se kao asimilacijski operatori, osim samih afrikata i frikativa, javljaju i prirodan i brz tempo govora te vrsta artikulacijskog zgloba u kojem su promatrani glasnici u kontaktu. Na temelju niza akustičkih varijabli pokazalo se da se

ostvaruje različit stupanj i oblik asimilacije, da brzi tempo pridonosi većem stupnju asimilacije, da je asimilacija veća u artikulacijskim zglobovima niže razine i, konačno, da su jezična i govorna razina govorne proizvodnje u dinamičnom odnosu na koji utječu različiti faktori.

Konferencije Komisije su obično prigoda za održavanje sjednice Komisije na kojoj se raspravlja o organizacijskim pitanjima. Na sjednici u Pragu raspravljano je o mjestu, vremenu i temama sljedeće konferencije te je predloženo da se ona održi u Zagrebu u proljeće 2021. godine, a da uz redovitu temu (metodička i metodološka pitanja fonetskih i fonoloških istraživanja slavenskih jezika) dodatne teme budu govorni ritam u slavenskim jezicima i primjena suvremenih fizioloških metoda u istraživanju fonetike slavenskih jezika. Kao pričuveni organizator sljedeće konferencije predloženo je Skoplje. Međutim, na temelju konzultacija održanih neposredno nakon konferencije u Pragu s Anđelom Frančić, predsjednicom Hrvatskoga slavističkog komiteta i odluke Odsjeka za fonetiku Filozofskog fakulteta u Zagrebu da prihvati organizaciju konferencije, zaključeno je da se ona održi u Zagrebu 14. i 15. travnja 2021. godine, te vjerujemo da ćemo biti dobri domaćini sljedećeg susreta fonetičara i fonologa slavenskih jezika i da će zagrebačka konferencija biti radno uspješna kao što je bila ova u Pragu.

Prikaz

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<https://doi.org/10.22210/govor.2019.36.13>**Diana Tomić***dtomic@ffzg.hr*

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Hrvatska

Izvještaj o radu Odjela za fonetiku od lipnja 2018. do lipnja 2019. godine

U akademskoj godini 2018./2019. Odjel za fonetiku nastavio je s uobičajenim aktivnostima. Održana su predavanja u dva ciklusa: *Interdisciplinarni pristupi proučavanju komunikacije* i *Suvremeni istraživački pristupi govoru i jeziku* koje je koordinirala dr. sc. Diana Tomić. Osim redovitih susreta, članice predsjedništva sastajale su se i razgovarale o različitim izazovima unutar struke te su održale redoviti sastanak predsjedništva 1. srpnja 2019.

Predavanja i sastanci

Tijekom akademske godine održano je osam stručnih predavanja:

Ciklus *Interdisciplinarni pristupi proučavanju komunikacije*

- dr. sc. Jelena Jurišić, doc. (Hrvatski studiji): *Komunikologija – interdisciplinarna znanost* (29. listopada 2019.)
- dr. sc. Ivana Čerkez Britvić (Hrvatski sabor): *Komunikacija medija i parlamenta* (26. studenoga 2019.)
- dr. sc. Berto Šalaj, izv. prof. (Fakultet političkih znanosti): *Populizam i demokracija* (17. prosinca 2019.)
- dr. sc. Sunčica Bartoluci, doc. (Kineziološki fakultet): *Komunikologija i sport* (28. siječnja 2019.)
- prof. dr. sc. Nada Zgrabljic Rotar (Hrvatski studiji): *Komunikacijske znanosti danas: novi mediji, nove teorije* (25. veljače 2019.)

Ciklus *Suvremeni istraživački pristupi govoru i jeziku*

- prof. dr. sc. Julian Bradfield (Sveučilište u Edinburghu): *The sound of a spherical cow* (25. ožujka 2019.)
- dr. sc. Marko Liker, izv. prof. (Filozofski fakultet): *Koartikulacija: što sve ne znamo o govoru?* (15. travnja 2019.)
- prof. dr. sc. Anita Peti-Stantić (Filozofski fakultet): *Strukture vokabulara za strukture mišljenja: od fonetike do semantike* (20. svibnja 2019.)

Godišnja skupština Odjela za fonetiku

Godišnja skupština održana je 1. srpnja 2019. Kao i inače, podnesen je izvještaj o radu i aktivnostima Odjela u protekloj akademskoj godini i predstavljen je plan aktivnosti za iduću godinu, s posebnim naglaskom na organizaciju skupa Istraživanja govora u prosincu 2019. Također, na prijedlog članova, odlučeno je da se mijenja termin predavanja zbog malog odziva. Prijedlog voditeljice da se predavanja održavaju četvrtkom u 14 sati jednoglasno je prihvaćen.

Na kraju službenog dijela skupštine članovima Odjela izvodenjem govora predstavili su se studenti fonetike s kolegija Govorništvo.

Govore su izveli:

- Nina Nodilo: *Govor nahvao,*
- Jelena Konjevod: *O psima i govorima,*
- Mateo Miličević: *Svemir u fontani,*
- Tihana Martinjak: *Brzi na gasu, brzi na jeziku.*

Izvještaji s konferencija te znanstvenih i stručnih skupova

Članovi Odjela za fonetiku i dalje redovito aktivno sudjeluju na znanstvenim i stručnim skupovima u zemlji i inozemstvu. Na godišnjoj skupštini Odjela za fonetiku članovi i voditeljica Odjela izvijestili su o aktivnostima u prethodnoj akademskoj godini. Skupovi su već prikazani u prošlogodišnjim brojevima časopisa *Govor*. Osim tih skupova, dr. sc. Elenmari Pletikos Olof sudjelovala je u radu Manchesterske konferencije za fonologiju s koje donosi nove uvide u disciplinu koja je kod nas zapostavljena. Čini se da je godina bila nešto skromnija po broju skupova, no treba imati na umu da se u kolovozu 2019. održao Svjetski fonetski kongres u Melbourneu (Australija), na kojem je sudjelovalo nekoliko članova Odjela, a budući da je to izrazito velika i važna konferencija, ponosni smo na naše članove koji su na njoj sudjelovali.

Časopis *Govor*

Govor izlazi redovito. Godišnja pretplata na dva broja časopisa *Govor* iznosi 50 kn.

Godišnja skupština Hrvatskoga filološkog društva

Predsjedništvo Hrvatskoga filološkog društva održalo je sastanak 11. veljače 2019. te je sazvalo redovitu godišnju skupštinu Hrvatskoga filološkog društva 25. veljače 2019. Na Skupštini su predsjednici odjela i urednici časopisa podnijeli izvještaje o radu. Predstavljen je i plan aktivnosti za 2019. godinu te su podneseni financijski izvještaji i planovi. Godišnja skupština tradicionalno je započela predavanjem i stručnim razgovorom na određenu temu, koju je ove godine održala dr. sc. Iva Bašić s Odsjeka za fonetiku Filozofskog Fakulteta pod naslovom: *Akustička analiza vokala hrvatskoga i srpskoga govora.*

UPUTE AUTORIMA

Časopis *Govor* objavljuje znanstvene i stručne priloge koji pridonose razvoju znanosti o govoru – izvorne znanstvene radove, studije, stručne radove, pregledne članke, znanstvene eseje, prethodna priopćenja i prikaze. Časopis izlazi dva puta godišnje. Rukopisi se šalju elektroničkom poštom na adresu govor@ffzg.hr.

Primaju se radovi na hrvatskom i engleskom jeziku. Molimo Vas da svakom rukopisu pisanom na hrvatskom jeziku, a koji je pripremljen prema uputama, priložite na kraju još i na engleskom jeziku naslov, opis slika i tablica te prošireni sažetak (*summary*) opsega od 1 800 do 2 500 znakova. Iz tog sažetka te opisa slika i tablica čitatelji koji će čitati samo dijelove teksta na engleskom trebaju saznati najvažnije informacije koje je autor člankom želio prenijeti. Savjetujemo da prošireni sažetak uključuje vrlo kratak uvod i postavljanje problema, opis istraživanja, dobivene rezultate i kratak komentar.

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Članak u časopisu

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Blumstein, S. (1995). On the neurobiology of the sound structure of language: Evidence from aphasia. U K. Elenius i P. Branderud (ur.), *Proceedings of the XIIIth International Congress of Phonetic Sciences*, vol. 2 (str. 180–185). Stockholm: KTH i Sveučilište u Stockholmu.

Članak odnosno poglavlje u knjizi više autora

MacNeilage, P. F. (1999). Acquisition of speech. U W. J. Hardcastle i J. Laver (ur.), *The Handbook of phonetic sciences* (str. 301–332). Oxford, UK; Malden, Mass.: Blackwell Publishers.

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