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Theory of mind in children with developmental language disorder – developmental tendencies

Abstract: *Theory of mind (ToM) refers to the complex cognitive ability allowing attribution of mental states to others and understanding that others may have different beliefs, intentions and desires which are different than our own. Developmental language disorder (DLD) is characterized by persistent deficits in the acquisition, comprehension, production or use of language. These children, in addition to language difficulties, may also have a spectrum of cognitive deficits. Research of ToM in DLD children started relatively recently, and the data so far have been quite inconsistent. The aim of our study is to compare ToM abilities and their developmental pattern between DLD and typically developing (TD) children, as well as to investigate potential differences between two main DLD subtypes (expressive and mixed) which differ dominantly regarding to the level of difficulties in language comprehension. The sample consisted of 119 participants aged between five to ten years, divided into two groups, 69 children with DLD and 50 TD children. Sally-Anne false belief task was used as a measure of ToM ability. The results indicate a significant developmental delay of ToM ability in children with DLD with no significant differences between the two DLD types. This indicates that children with DLD have significant difficulties in understanding that actions of others depend on their beliefs rather than simply the real situation itself, as well as that belief and reality often diverge. The results of the research are discussed from two aspects, by comparison with the results of other studies that investigated ToM in DLD children and through the prism of difficulties in social and academic functioning that these children may have. Practical implications are also given, as well as some of the specific techniques that can facilitate the ToM development in children with DLD within the school environment.*

Keywords: *theory of mind, developmental language disorder, social skills, school environment.*

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Introduction

Theory of mind

Theory of mind (ToM) refers to the complex ability we use to predict and explain the behavior of others based on their inner functioning, their feelings, intentions, desires, attitudes, beliefs and knowledge. These abilities allow attribution of mental states to others and understanding that others may have different beliefs, intentions and desires, and accordingly act differently (for review see Preckel et al., 2018).

There are two ToM components, social-perceptual and social-cognitive (Tager-Flusberg & Joseph, 2005). The social-perceptive component is an innate preference for stimuli coming from people, while the social-cognitive component is related to the ability to draw conclusions about mental states based on the integration of different types of stimuli (Tager-Flusberg & Joseph, 2005). Also, there is differentiation indicating “affective” versus “cognitive” ToM (Kalbe et al., 2010). Affective ToM refers to the attribution of emotional states to others and to empathy, while cognitive ToM refers to cognitive understanding of the difference between one’s own and the knowledge of others.

ToM develops gradually during childhood as a series of developmental achievements. In the early preschool period, children are able to have simple, non-egocentric visual perspectives. For example, they may conclude that other may see something they do not see and vice versa (the first level of visual perception knowledge). In particular, it is only during the early school period that children acquire a basic level of essential understanding of the mind as an active, interpretive, constructive processor (e.g., Barquero et al., 2003). A particularly important milestone in the development of ToM is the understanding of false beliefs. Understanding false beliefs is about knowing that one can have a belief that is different from reality and that people can have different beliefs about the same situation. False

belief understanding is a well-studied milestone in the development of the social-cognitive component of ToM that occurs around age of four in typically developing (TD) children (for review see Poulin-Dubois, 2020). Specifically, around the age of four children are able to master the first-order ToM on false belief task, thus showing knowledge of beliefs as mental entities that can deviate from reality and between individuals (for review see Poulin-Dubois, 2020). At the age of seven, TD children usually master the second-order ToM, which implies that they are capable of recursive thinking about the sequential thinking of two people (Miller, 2009).

The relationship between language and ToM abilities changes direction of causality during development. Namely, sensitivity to people’s intentions and preferential attention to people, which develop early in TD children, are thought to precede and enable language development (De Villiers, 2007). Although the direction of causality of individual aspects of ToM and language abilities is not yet clear between the age of two and four, in terms of beliefs research clearly indicates that language development precedes the development of ToM. Namely, children around the age of three begin to use verbs indicating mental states, such as *think*, *know*, *forget* or *remember*. On the other hand, before the age of four, the child is not able to master the first-order ToM on the false belief test. This suggests that language development may be a precursor to this segment of ToM (De Villiers, 2007). This is supported by the results of a number of longitudinal studies of preschool children which consistently indicate that language skills predict a false belief performance, and not vice versa (e.g., de Villiers & Piers, 2002; Slade & Ruffman, 2005). Also, there is a generally accepted view that the child must be familiar with the language of the mind in order to pass false belief tasks (Farrar et al., 2009).

In addition to the significant correlation with language abilities, previous research indicates ToM abilities as significant predictors of school achieve-

ment in TD children. Namely, preschool children who are better at inferring the mental states of others show a higher level of achievement in elementary school (Lecce et al., 2014). Also, the preschoolers' false belief performance predicts later literacy (Blair & Razza, 2007). In addition to academic achievement, the school-age children who have better performance on false belief tasks have higher social competence, are more accepted by and form better friendships with peers (Banerjee et al., 2011; Devine et al., 2016; Fink et al., 2015).

Understanding ToM development is very important for the school context for several reasons. There is a body of evidence showing that the cognitive component of the ToM significantly affects academic achievement. Having in mind that school context is also a social context, and that learning can be viewed as a social process (Vigotski, 1996), ToM has particular importance for overall school functioning. ToM achievement significantly affects oral reading and reading comprehension (Atkinson et al., 2017; Blair & Razza, 2007). In particular, a study of Blair and Razza (2007) showed that in preschool ToM is related to phonemic awareness, letter knowledge, and mathematical ability in the school-age period, independently of other cognitive abilities.

ToM can shape how students interpret and react to teachers' critical and constructive feedback regarding their schoolwork or discipline issues. Lecce and colleagues (2014) have found that children with proficient mind reader skills are more responsive to criticism and better in understanding the intentions of teachers' comments and reactions. This allows them to use teachers' feedback in appropriate way, which can have a positive impact on their academic achievement. A recent study shows that children who understand their teachers' feedback as constructive (and are motivated to improve their mistakes) are also more likely to achieve higher academic scores (Smogorzewska et al., 2022).

ToM has a significant influence on the development of prosocial skills, in particular cooperation

skills, affective empathy, helping and comforting skills which are essential for forming positive relationships with peers (Imuta et al., 2016; Metallidou et al., 2018). The relation between ToM and social competence can be observed across time – from preschool (Fink et al., 2015; Weimer & Guajardo, 2005), younger school-age (Liddle & Nettle, 2006) to middle childhood and adulthood (Weimer et al., 2017). A meta-analytic review of 76 studies focused on children aged between 2 and 12 years offers evidence that association between ToM and prosocial behaviour is even stronger among the older group of children (Imuta et al., 2016), which indicates the great importance of applying early intervention to promote socio-cognitive abilities. Difficulties with ToM are also associated with more frequent peer victimization (e.g. Shakoor et al., 2012). Children with less developed ToM do not have a clear perception of what others think of them and they are less successful in recognizing non-verbal signals, other people's motives, intentions and feelings (Weimer et al., 2020). Also, they do not have good conflict resolution skills or know how to defend themselves, misinterpreting social signals in ambiguous situations, which can predispose them to peer violence (Shakoor et al., 2012; Wahyuningsih & Novitasari, 2016).

In summary, the data so far have indicated that this complex ability, closely related to the language, can significantly influence the academic achievement and shape the child's social milieu at school age.

Children with developmental language disorder and ToM abilities

According to ICD-11 classification (WHO, 2020), developmental language disorder (DLD) is disorder characterized by persistent deficits in the acquisition, comprehension, production or use of language (spoken or signed language) that occur during the developmental period, usually in early childhood, and can cause significant limitations in a one's ability to communicate. The child's ability to under-

stand, produce or use language is significantly below expectations for his/her age. Language deficits cannot be explained by other neurodevelopmental disorders, sensory impairments or neurological conditions, including brain injuries or infections (WHO, 2020).

DLD is manifested by an impairment of expressive and/or receptive language modalities. Depending on the impaired modality of the language function, two subtypes of DLD can occur, expressive and mixed. The expressive type is characterized by predominant deficits of expressive language abilities, while receptive language skills are quite preserved. On the other hand, the mixed type of DLD is characterized by deficits of both expressive and receptive language abilities to similar extent (WHO, 2020).

Although the diagnosis of DLD excludes more serious impairments of nonverbal abilities, these children may exhibit significant difficulties in developing cognitive abilities, especially those closely related to language development. The research of cognitive abilities in DLD children has shown that these children may have difficulties with attention, memory, processing speed and executive functions (Boerma et al., 2017; Guiraud et al., 2018; Kaganovich, 2017; Rodríguez et al., 2017; Drljan & Vuković, 2020), but also with more complex cognitive abilities such as ToM (Andres-Rokueta et al., 2013; Farrant et al., 2006; Nilsson & de Lopez, 2016).

Research data suggest that children with DLD have better ToM skills compared to children with autism spectrum disorder (Loukusa et al., 2014). However, it is still unclear whether children with DLD differ from TD children regarding ToM. There is a limited number of studies and the obtained data are quite contradictory. Namely, the data from some studies indicate that children with DLD have significant difficulties in ToM development (Andres-Rokueta et al., 2013; Farrant et al., 2006), while some other studies have not found significant differences in this cognitive ability between DLD and TD peers (Miller, 2001, 2004; Ziatas et al., 1998). However, the studies so far have supported the fact that

children with DLD may have poor performance on ToM tasks compared to their TD peers, usually below average and sometimes significantly below age expectations (Nilsson & de Lopez, 2016).

Method

Aims. According to the literature review on ToM abilities in DLD children, it is obvious that there is a small body of research in this field. Additionally, due to various data from the studies, it is still not clear whether, and to what extent, DLD children have difficulties in the development of ToM skills. Also, it is not entirely clear which developmental pattern of ToM abilities characterizes DLD children in relation to different forms of this disorder. In addition, ToM studies in Serbian-speaking children are rare, both in TD and children with developmental disabilities (Cvijetić, 2017; Glumbić et al., 2008), while research on this complex ability in DLD children is not available to us. Given that there are indications of cross-cultural differences in ToM abilities (Liliard, 2006; Liu, 2008), the research from our cultural background is gaining importance. Accordingly, the aim of our study is to compare the abilities of ToM between DLD and TD children, as well as to compare the patterns of ToM development between these two groups of children. An additional aim of our study is to investigate potential differences between the two main DLD subtypes.

The sample consisted of 119 participants aged between five to ten years, divided into two groups, 69 children with DLD and 50 TD children.

The children with DLD were recruited from local speech and language therapy services in Belgrade, Serbia. All children from the DLD sample attended a regular preschool and school program, with the exception of two children who started school a year later. In order to confirm the diagnosis, all the children in the DLD group were tested by two qualified speech and language therapists. Language abilities were assessed by language indexes following the

CELF-4 (Clinical Evaluation of Language Fundamentals 4th Edition, Semel et al., 2003) protocol for evaluation of language delay. Core Language Score (CLS), as a measure of general language ability, was used to quantify an overall language performance in children. CLS is used to make decisions about the presence or absence of a language disorder. CLS is derived by summing the scaled scores of four subtests: Concepts and Following Directions, Word Structure, Recalling Sentences and Formulated Sentences. All children with DLD scored 1.5 SD and more below the mean for their age, using normalized standard scores for each age group on the CELF-4.

CELF-4 was translated and adapted, and it showed good psychometric characteristics for determining the presence of language delay in Serbian-speaking children (Ječmenica, 2022). After confirming the diagnosis of DLD in children, children were divided into two groups based on measures of the Receptive Language Index Score (RLI) and Expressive Language Index Score (ELI). Word Classes 1- Receptive, Concepts and Following Directions and Sentence Structure composed the RLI, and

Word Classes 1- Expressive, Recalling Sentences and Word Structure composed the ELI. Children with expressive type of DLD (DLDexp) had ELI score of at least 1 SD below the mean for their age, while performance on Receptive Language Index Score was above the 16. percentile. Children with mixed type of DLD (DLDmix) had scores of at least 1 SD below the mean on both, RLI score and ELI score.

The TD children were recruited from local preschools and schools, also in Belgrade.

The data on intelligence were taken from psychological documentation and included the full and nonverbal IQ score, as well as the instrument with which it was assessed. Wechsler Intelligence Scale for Children Revised (WISC-R) normed on the Serbian population (Biro, 1997) was administered to all children.

All children are native Serbian speakers. Parents provided informed consent and all of the children provided assent prior to taking part.

The data on age, nonverbal IQ and gender distribution in DLD and TD groups are given in Table 1.

Table 1. Participants' characteristics.

		Age (months)	Nonverbal IQ	Gender	
Group	n	Mean (SD)	Mean (SD)	n (%)	
DLD	69	77.435(12.963)	96.120(5.081)	Boys	51(73.9)
				Girls	18(26.1)
TD	50	81.240(9.572)	94.826(6.460)	Boys	23(46.0)
				Girls	27(54.0)
		$F_{(1)} = 3.086$ $p = .082$	Welch $F_{(1;116,167)} = 1.493$ $p = .224$	$\chi^2_{(1)} = 8.456$ $p = .004$	
DLDexp	40	79.775(13.833)	96.000(7.035)	Boys	28(70.0)
				Girls	12(30.0)
DLDmix	29	74.207(11.008)	93.207(5.267)	Boys	23(79.3)
				Girls	6(20.7)
		$F_{(1)} = 3.202$ $p = .078$	$F_{(1)} = 3.246$ $p = .076$	$\chi^2_{(1)} = 0.350$ $p = .554$	

Legend: DLD – developmental language disorder; TD – typically developing; DLDexp – expressive type of developmental language disorder; DLDmix – mixed type of developmental language disorder

There were no statistically significant differences between DLD and TD children regarding age ($p > .05$), but groups differed regarding gender ($p < .05$) (Table 1). On the other hand, there were no statistically significant differences between the two DLD groups regarding both age and gender ($p > .05$) (Table 1). Also, DLD and TD groups did not differ regarding nonverbal IQ score ($p > .05$), nor did children with different types of DLD ($p > .05$) (Table 1).

Due to the previously mentioned developmental cut of mastering first- and second-order ToM at the age of four and seven, the sample was divided into two age categories, five- and six-year-old group and seven-year and older group. Descriptive data on age categories within all groups are given in Table 2.

Instruments. Sally-Anne false belief task (Baron-Cohen et al., 1985) was used as a measure of ToM ability. Sally-Anne task is a common tool for assessing the socio-cognitive component of ToM. This task was presented to the child in the form of a story with visual support (photo). The line of the story is: "Two girls are called Sally and Anne. Sally has a black box and Anne has a white box. Sally put the ball in the black box and left the room. While she was not there, Anne took the ball from the black box and moved it to the white box. Sally is back and she wants to play

with a ball". Then the child is asked, "Where do you think Sally will look for her ball?" If the child answers correctly, he or she is considered to have mastered the first-order ToM on false belief task. Additional questions check the child's understanding of reality ("Where is the ball really, in which box?"), as well as memory ("Where was the ball in the beginning?"). In order to assess the second-order ToM, the story expands by telling the child that Sally peeked through the keyhole and saw Anne move the ball, after which the child is asked: "What does Anne think, where will Sally look for the ball?". In this way we assess the understanding of another person's beliefs (second-order ToM). Mastering of the first- and second-order ToM was assessed in all children, as well as additional questions. Three children from the DLD group who did not answer the second or third question correctly were excluded from the sample. One child excluded from the sample was in DLDexp group, while two excluded children belonged to the DLDmix group. The answers to two questions assessing the first- and second-order ToM were binary coded as passed and failed. For the purpose of the analyses that require a linear variable, the total score on the Sally-Anne task was calculated as the number of points obtained from the answers to all four questions. Since all children in the sample answered the control questions correctly (understanding of reality and memory), the min-

Table 2. Sample distribution through age categories.

Group	Age category	n	%
DLDexp	5-6	25	33.8
	≥ 7	15	33.3
DLDmix	5-6	22	29.7
	≥ 7	7	15.6
TD	5-6	27	37.5
	≥ 7	23	51.1

Legend: DLDexp – expressive type of developmental language disorder; DLDmix – mixed type of developmental language disorder; TD – typically developing

imum score achieved in the sample was two. Children who answered correctly the question related to understanding the first-order ToM received three points, while children who additionally answered correctly the question related to understanding the second-order ToM received the maximum number of points - four.

Statistical approach. The data analysis included the methods of descriptive (mean values and standard deviation) and inferential statistics. For comparing ToM performance between groups, as well as age and gender differences, Chi-square test, analysis of variance – ANOVA (one and two-way) and *post-hoc Scheffe* method were used. In cases where the equivalence of variance assumption was violated, Welch's approximate method of the analysis of variance was used and Fisher's exact test was used when the Chi-square assumption was violated. SPSS software (version 26.0) was used for data analysis.

Results

Given the evidence of gender influence on cognitive abilities (Ardila et al., 2011), as well as on ToM (Adenzato et al., 2017; Stępień-Nycz et al., 2021), we employed the two-way ANOVA (gender x language groups) in order to investigate gender differences between TD and DLD.

The results of the two-way ANOVA showed that there are no statistically significant gender differences regarding total score on Sally-Anne task ($F_{(1,115)} = 0.079$, $p = .779$), neither in TD group, nor in DLD group of children. Namely, the interaction effect between gender and language groups is not statistically significant, $F_{(1,115)} = 0.121$, $p = .728$. A statistically significant main effect of language ability was found, $F_{(1,115)} = 32.487$, $p = .000$, partial $\eta^2 = 0.22$. Children with DLD have a significantly lower achievement on Sally-Ann task than children with TD (Table 3).

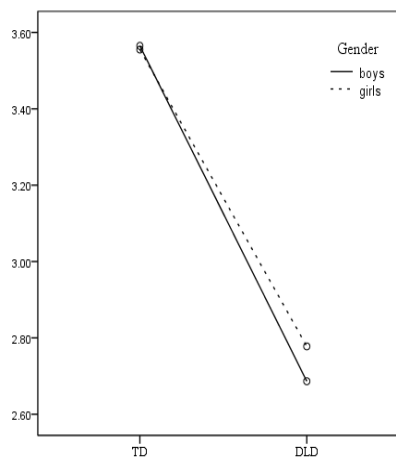


Figure 1. Gender by language groups differences on Sally-Anne task – total score

Using one-way ANOVA, a more detailed analysis of the differences between the two DLD groups and TD children was performed with a *post-hoc Scheffe* test. Group differences regarding the total score on Sally-Anne task are given in Table 3.

Scheffe test for multiple comparisons found that the mean value of the total score on Sally-Ann task was significantly different between TD and DL-Dex groups ($p = .000$, 95% C.I. = [-1.090, -0.330]), as well as between TD and DLDmix groups ($p = .000$, 95% C.I. = [-1.462, -0.624]). Both DLD groups of children performed significantly worse than their TD peers. However, no statistically significant differences were found between the two DLD subtypes (Table 3).

To explore if there are age differences in mastering ToM task between the two DLD subtypes, the two-way ANOVA was applied (DLD subtypes x age groups). The obtained results indicate that there are no statistically significant differences in ToM development between the preschool and school-age DLD children ($F_{(1,65)} = 1.553$, $p = .217$). Also, no interaction effect was observed between DLD and age groups ($F_{(1,65)} = 0.002$, $p = .961$).

Table 3. Total score group differences on Sally-Anne task.

Sally-Anne task (total score)	Min	Max	Mean	SD	F(2)	p
DLDexp	2	4	2.850 ^a	0.802	21.800	.000
DLDmix	2	4	2.517 ^b	0.634		
TD	2	4	3.560 ^{ab}	0.704		

Legend: DLD – developmental language disorder; TD – typically developing; DLDexp– expressive type of developmental language disorder; DLDmix – mixed type of developmental language disorder; (a)p = .000; (b)p = .000

In order to investigate the mastering of ToM levels, a more detailed analysis was performed in age categories. To test for group differences in age categories, a chi-square test was performed for each condition, using the frequencies of passed versus failed trials only. First, we investigated whether there are differences between the DLD as a whole group and their TD peers, regarding the mastering of the first and second-order ToM in age categories when they are expected. Also, in order to investigate the extent of developmental delay, we examined the differences in mastering the first-order ToM between DLD and TD children aged seven and older. Because the chi-square assumption was violated, we used Fisher's exact test in order to compare mastering the first-order ToM between DLD and TD children aged seven and older. Group differences in age categories are given in Table 4.

Significant group differences were observed between DLD, as the whole group, and TD children in both age categories. Namely, DLD children aged five and six performed significantly worse than their TD peers regarding the mastering of the first-order ToM. Also, DLD children aged seven and older performed significantly worse regarding mastering the second-order ToM than their TD peers. Additionally, even children with DLD aged seven and older differ significantly from their peers regarding mastering the first-order ToM.

In order to investigate the differences between the two DLD subtypes, chi-square test was used for comparing the frequencies of passed versus failed trials in age categories. Because the chi-square assumption was violated, we used Fisher's exact test in order to compare mastering second-order ToM of two DLD groups with children aged seven and older. Group differences in age categories are given in the Table 5.

Table 4. First and second-order ToM group differences within age categories.

Age category	Sally-Anne task questions	Group	Passed (%)	Failed (%)	χ^2	p
5-6	First-order ToM	DLD	51.1	48.9	7.206	.007
		TD	85.2	14.8		
≥7	Second-order ToM	DLD	31.8	68.2	6.404	.011
		TD	73.9	26.1		
≥7	First-order ToM	DLD	63.6	36.4		.035
		TD	91.3	8.7		

Legend: ToM– Theory of Mind; DLD – developmental language disorder; TD – typically developing

Table 5. Performance on Sally-Ann task in DLD groups

Age category	Sally-Anne task questions	Group	Passed (%)	Failed (%)	χ^2	P
5-6	First-order ToM	DLDexp	60.0	40.0	1.028	.311
		DLDmix	40.9	59.1		
≥7	Second-order ToM	DLDexp	40.0	60.0		.350
		DLDmix	14.3	85.7		

Legend: ToM – Theory of Mind; DLDexp – expressive type of developmental language disorder; DLDmix – mixed type of developmental language disorder

The analysis did not show differences between the two DLD subtypes in both age categories. Specifically, five- and six-year-old children with expressive and mixed DLD did not differ significantly regarding the mastering of the first-order ToM, nor did seven-year and older children regarding the mastering of the second-order ToM.

Discussion

This study aimed to investigate the cognitive component of ToM in children with DLD in a more comprehensive way, clarifying at what level the delay occurs and to what extent, and whether there are differences between the two comprehension-levels related DLD subtypes.

The results of our research showed that DLD children, as a group, have significantly worse performance on the false belief task, compared to TD children. Specifically, DLD children have shown the developmental delay of the first- and second-order ToM. This finding adds further support to a growing body of research indicating that DLD is associated with a delayed ToM development (Andres-Rokueta et al., 2013; Farrant et al., 2012; Guiberson & Rodriguez, 2013; Hanley et al., 2014). This provides evidence that the children with DLD have difficulties in understanding that actions of others depend on their beliefs rather than simply the real situation itself, as well as that a belief and reality often diverge. On the other hand, our results are not in line with

a smaller number of studies suggesting that there are no significant differences between DLD and TD children regarding the mastering of the first- and second-order ToM (Miller, 2001, 2004; Ziatas et al., 1998). However, in the study conducted by Ziatas and colleagues (1998), differences in the performance of 12 DLD and 12 TD children were analyzed only by the percentage of the failed and passed trials, and one score was calculated for both false belief levels based on the probability of achieving a combined success. However, it should be borne in mind that this method of analysis is not a reliable indicator of the ToM mastering, more suggesting possible tendencies.

In addition, the results of our study suggest a greater extent of developmental delay in these children, of two years and more. Namely, school-aged DLD children still have difficulty in understanding the first-order ToM. There is a sparse body of evidence about ToM in school-aged DLD children, especially about understanding the beliefs of others. Farmer (2000) found that DLD children who attend school within segregation model have worse performance on the false belief task, while DLD children who attend school within integrated model have performance similar to TD children. Our results are not congruent with these, because all school-aged children from our sample attend regular school system (similar to the integrated model). In Serbia children with DLD attend the mainstream school system with the continuation of speech and language

therapy in corresponding institutions, or schooling is delayed if the child's language abilities are significantly below the level expected for that age. However, it should be noted that the sample of DLD children in the Farmer's study (2000) included only eight children each in two groups, which is a very small sample for drawing reliable conclusions. Other studies included either only DLD preschool children (Farrant et al., 2012; Guiberson & Rodriguez, 2013; Miller, 2004) or seven-year-olds together in a group with younger children (Andres-Rokueta et al., 2013; Miller, 2001; Ziatas et al., 1998).

The second part of our results referred to differences in ToM between the two DLD types. Specifically, the analysis showed that both groups of children, DLDexp and DLDmix, have significantly worse TOM performance than TD peers, but that they do not differ among themselves. Differences were not confirmed neither at preschool or school age.

Some data from literature indicate that weaker receptive language skills carry a greater risk of poor social and behavioural outcomes in DLD children (Conti-Ramsden et al., 2013; Snowling et al., 2006). On the other hand, only few studies investigated the influence of receptive language deficits on TOM and data so far have not been consistent, mostly due to different methodologies. Clegg and colleagues (2005) found that adults with a history of receptive DLD continued to have marked ToM difficulties compared to individuals without a history of language disorders. Our results partially confirm the data that ToM difficulties persist even at school age in DLD children with an impaired receptive language. However, in the study by Clegg and colleagues (2005), the sample included only participants with the receptive form of DLD, without comparison with those who had an expressive type of DLD. On the other hand, Forrest and colleagues (2022) did not find significant correlations between receptive language abilities and cognitive and affective ToM in DLD adolescents. The results

of our study confirm these results to some extent, given that no differences were found in the cognitive ToM component between DLD children with and without the impaired receptive language. One of the shortcomings of our study is the small number of school-aged children with the mixed type of DLD ($n=7$), which makes it difficult to draw reliable conclusions about the developmental tendencies of this DLD group. Given that receptive language impairment makes the disorder itself more severe, and it is associated with poorer outcomes in older age, this DLD group deserves further investigation.

Considering that DLD children can have significant language difficulties even at school age (e.g. Del Valle et al., 2018, Drljan & Vuković, 2019), and that poor language abilities often lead to difficulties in mastering academic skills (e.g. Harrison et al., 2009; Oliveira et al., 2021), these findings together with our data of underdeveloped ToM put these children at double risk of poor academic achievement and social engagement in the school environment. This implies the application of additional didactic methods for these children, which would facilitate academic mastering, as well as relationships with peers and teachers. This is especially important because further language development in this period mostly takes place through learning and an intensive communication with peers and teachers at school.

The findings of some studies can provide guidance to teachers working with DLD children. For example, Lecce and colleagues (2021) have discovered that teachers' tendency to use mental-state language during teaching and their preference for using conversational-instruction strategies impact children's level of ToM. In other words, interactions rich in mental-state language and discourse that prompts consideration of others' perspectives in school context represent important mechanisms of ToM development beyond family environment. In addition, Durrleman and Delage (2020) study indicates possible therapeutic intervention for children

with DLD which is focused on complements training. The various activities of the applied program explicitly targeted the complementation with verbs of communication (e.g., “Can you tell John I am going home around 1 pm?”), from the aspect of comprehension and production. The results of that study indicate that both TD and DLD children significantly improved both skills – complementation as well as ToM.

Conclusion

The results of our study indicate a significant developmental delay of TOM abilities in DLD children for two years or more comparing to TD children. On the other hand, the data do not indicate significant differences between the expressive

and mixed type DLD, which suggests that the level of comprehension does not significantly affect the false belief performance. However, a small number of children with the mixed type DLD in our study is one of the limitations in drawing reliable conclusions, which is also an implication for future research.

Given the significant impact of ToM on academic and social skills in school-aged children, practical implications are given, as well as some of the specific intervention techniques which can be applied in working with DLD children, such as an increased use of words representing mental states, complementation with verbs of communication, and a greater reliance on conversation-based strategies during teaching.

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ТЕОРИЈА УМА ДЕЦЕ СА РАЗВОЈНИМ ЈЕЗИЧКИМ ПОРЕМЕЋАЈЕМ – РАЗВОЈНЕ ТЕНДЕНЦИЈЕ

Теорија ума (ТУ) односи се на сложену социокогнитивну способност, која омогућава закључивање о социјалним менталним стањима, као и менталним стањима других људи. Она омогућава тумачење и предвиђање понашања других на основу разумевања њихових осећања, намера, жеља, ставова, веровања и знања, што имплицира да се веровања, намере и жеље могу разликовати од особе до особе (Preckel et al., 2018).

ТУ се постепено развија током детињства, при чему је развој обележен неколиким кључним прекретницама. На раном предшколском узрасту деца почињу да овладавају способношћу заузимања перспективе, што им омогућава да разумеју да друге особе могу видети ствари другачије него они сами. Током раној школској узрасту почињу да схватају концепт ума као активност тумача, овладавајући базичним разумевањем менталних процеса (на пример, Barquero et al., 2003). Значајна прекретница у развоју ТУ је разумевање лажних веровања, односно препознавање да веровања других људи могу бити другачија од стварности и различита код појединаца. Типично, до четврте године деца овладавају ТУ првог реда, разумевајући веровања као менталне ентитете одвојене од стварности (Poulin-Dubois, 2020). Око седме године обично овладавају ТУ другог реда, што им омогућава да размишљају о мисаоним процесима других (Miller, 2009).

Однос између језика и ТУ током развоја указује на комплексну интеракцију когнитивних и језичких вештина. Сматра се да код деце типичног развоја (ТР) усмереност на намере других људи и интерперсонална преференција, које се јављају веома рано током развоја, претходе и поседују језички развој (De Villiers, 2007). Узрочна веза између ТУ и језичких способности није у потпуности разјашњена, иако истраживања указују на то да, када је реч о разумевању веровања, развој језика ипак претходи развоју ТУ (на пример, De Villiers & Piers, 2002; Slade & Ruffman, 2005). Овај однос постаје посебно важан када је реч о популацији деце са развојним језичким поремећајем (РЈП), где тешкоће у изражавању или разумевању језика могу утицати на развој ТУ. Код деце са РЈП експресивној тешкоће у изражавању могу ометајући овладавање вештинама разумевања менталних стања других. С друге стране, деца са РЈП мешовитој тешкоћи, који се манифестује тешкоћама у доменима и рецептивних и експресивних језичких способности, могу имати додатне проблеме у разумевању социјалних интеракција и интерпретирању намера других. Стога је разумевање развоја ТУ кључно за свеобухватно сагледавање развојних изазова са којим се срећу деца са РЈП.

Циљ овој истраживања је да се упоређују ТУ и њен развојни ниво између деце са РЈП и деце ТР, као и да се идентификују квалитетне разлике између два главна нивоа РЈП (експресивни и рецептивни), који се разликују према нивоу квалитета у разумевању језика. У ту сврху одабран је узорак од 119 испитаника узраста од пет до десет година, подељених у две групе, 69 деце са РЈП и 50 деце ТР. За процену ТУ коришћен је задатак лажног веровања „Сања и Ана” (енгл. Sally-Anne test, Baron-Cohen et al., 1985).

Резултати истраживања указују на то да деца са квалитетима у језичком развоју показују значајно нижи резултат на примењеном задатку у односу на децу ТР ($F_{(1,115)}=32,487$, $p=0,000$, парцијални $\eta^2=0,22$). Наредним анализама је утврђено да су ове разлике присутне и на предшколском и на основношколском узрасту, као и да не зависе од пола РЈП. Додатно, утврђено је да је код деце са РЈП присутно развојно кашњење од две године и више, имајући у виду да ова деца и на школском узрасту имају квалитете у разумевању ТУ првог реда. Изостанак разлика у нивоу развијености ТУ између деце са различитим нивоима РЈП указује на то да ниво језичког разумевања није пресудан чинилац у разумевању лажног веровања.

Резултати нашег истраживања који указују на недовољно развијену ТУ код деце са РЈП, уз чињеницу да језичке квалитете код ове деце могу перзистирати и на школском узрасту (нпр. Del Valle et al., 2018; Drljan & Vuković, 2019) и да често доводе до проблема у савладавању академских вештина (нпр. Harrison et al., 2009; Oliveira et al., 2021), указују на присуство двоструког ризика код ове популације – квалитетно лоша академска постигнућа и проблеми у вези са социјалном укљученошћу у школском контексту. Овакав налаз имплицира потребу за примењеном додатним дидактичким методама у раду са овом децом које би олакшале савладавање трајних и доследних формирање квалитетних односа са вршњацима и наставницима, што је од посебног значаја имајући у виду да се током школског периода даљи језички развој одвија углавном кроз учење и интензивну комуникацију у школи.

Кључне речи: теорија ума, развојни језички поремећај, социјалне вештине, социјална средина