

CONTRIBUTION AND IMPLICATION OF THEORY OF MIND: NEUROTYPICAL CHILDREN VS CHILDREN ON THE AUTISM SPECTRUM DISORDER

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Abstract

The aim of the paper is to get acquainted with theoretical and empirical knowledge about the theory of mind in children of neurotypical development and children with the autism spectrum disorder, to get informed with the stages and levels of development of the theory of mind and the differences in the theory of mind of children of neurotypical development and children with the autism spectrum disorder. The paper will also tackle the influence of social environment and demographic traits of children on the theory of mind.

The practical contribution of this paper reflects in the adaptation of the instruments used to evaluate the theory of mind. Considering the obvious lack of such research instruments in Serbian, the next steps would entail its standardization since the instrument can also be used for individual evaluation of the development level of both neurotypical and autistic children. Furthermore, the practical contribution of the study is expressed through the insight it provides in the profile of the theory of mind in children on the autism spectrum, which in clinical practice helps to distinguish this group of disorders with its particularities and to guide the psychological and defectological treatment and advisory work with parents in order to improve the children's socio-cognitive functions.

Key words: theory of mind, neurotypical children, children on the autism spectrum, socio-demographic characteristics.

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ДОПРИНОС И ИМПЛИКАЦИЈЕ ТЕОРИЈЕ УМА: ДЕЦА УРЕДНОГ РАЗВОЈА И ДЕЦА ИЗ АУТИСТИЧНОГ СПЕКТРА ПОРЕМЕЋАЈА

Апстракт

Циљ рада јесте упознавање са теоријским и емпиријским сазнањима о теорији ума деце уредног развоја и деце из аутистичног спектра поремећаја, упознавање са фазама и нивоима развоја теорије ума и разликама у теорији ума деце уредног развоја и деце из аутистичног спектра поремећаја. У раду ћемо се осврнути и на утицај социјалне средине у којој дете одраста и демографских карактеристика на развој теорије ума.

Практични значај рада огледа се пре свега у адаптацији инструмента за процену теорије ума на српски језик, а чија стандардизација треба да буде следећи корак, с обзиром на недостатак такве врсте инструмента код нас, који се може користити у истраживањима, али и у индивидуалној процени како би се одредио достигнут ниво развоја теорије ума и код деце типичног и атипичног развоја. Практични значај рада, односно истраживања, јесте и у новом приступу у психодијагностици деце и младих јер нам даје увид у профил теорије ума код особа из аутистичног спектра поремећаја који може у клиничком раду да издвоји ову групу поремећаја и да њене специфичности у погледу теорије ума и да нам да смернице за психолошко-дефектолошки третман и саветодавни рад са родитељима у циљу побољшања њиховог соцо-когнитивног функционисања.

Кључне речи: теорија ума, деца уредног развоја, деца из аутистичног спектра поремећаја, соцо-демографске карактеристике.

INTRODUCTION

Theory of mind refers to the capacity of attributing a range of mental states (desires, intentions, feelings) to oneself and others and using that information to explain and predict behaviour (Baron-Cohen, 2001; Barr, 2008). We use theory of mind to explain our behaviour to others by saying what we think, feel, and we also use theory of mind to interpret the behaviour of others by attributing desires, intentions, feelings, and beliefs to them. Theory of mind comprises one of the essential abilities that makes us human (Whiten, 1993, according to Baron-Cohen, 1998).

How do children succeed in discovering that there are mental states that are not directly observable and govern their actions and those of the people in their immediate surroundings? This question has been the focal point for thirty years in the field of research identified by the term “theory of mind”, because it enables reflection on and analysis of interpersonal relationships, which inevitably leads to social adaptation.

One of the important issues of developmental psychology, as well as psychopathology, is the cognitive development of children, and within it, social cognition, the core of which is the development of theory of mind, as the ability to gain a “mental perspective” on oneself and others (Astington, Edward, 2010). Early childhood is the period of intense development of theory of mind. During this period, children gradually

develop an understanding that in addition to the objective, external world, there is also the internal world.

Development of Theory of Mind

The first studies of theory of mind aimed at defining theory of mind as the ability steadily growing and they also determined stages of its development.

Stage 1: it is at this stage that getting a perspective and intentionality begin to develop through imitation and joint attention

Stage 2: at this stage, children between one year and a half and two years of age begin to understand the concept of desire and become engaged in pretend play

Stage 3: understanding knowledge and belief

Stage 4: understanding first-order false beliefs, which is the understanding that a child's belief about the world may contrast with reality

Stage 5: understanding first-order and second-order false beliefs, which implies understanding that it is possible to hold a false belief about someone else's belief.

According to theory of mind, the dimensions of theory of mind are as follows:

The cognitive dimension: involving thinking about thoughts, knowledge, intentions, and beliefs of others. The affective dimension: involving thinking about emotions and experiencing them, which can be further broken down into an affective-cognitive dimension understood as cognitive empathy, i.e. awareness or recognition of one's own emotions and other people's emotions, and affective empathy that implies the ability to respond to the emotions of others (to feel what others are feeling). Interpersonal theory of mind involves reflection about the mental states of others and the intrapersonal theory of mind as the ability to reflect upon one's own mental states (Westby, 2014).

Theory of Mind in Children on the Autism Spectrum Disorder

Autism spectrum disorder is a developmental disorder characterized by qualitative impairment of reciprocal social interactions, verbal and non-verbal communication, as well as a scarce stereotypical, repetitive repertoire of interest and activity (Поповић-Деушић, 1999). It affects at least one in a thousand children. Although biologically conditioned, with its basis in genetics, autism diagnosis is still made through behavioural criteria. It is characterized by early onset, affects all psychic functions, and with a complete clinical picture developing during the first five years of life, and the disorder itself lasts a lifetime.

Social interaction impairments are reflected in non-verbal communication impairment from the early stages of life such as looking

someone in the eyes, tracking gaze direction, supporting facial expression and gestures, not imitating their parents. Joint attention skills, gaze tracking, and proto-declarative pointing are significant clinical indicators if they do not occur in children who are 18 months of age. Throughout childhood, children often refuse to cooperate and interact with others. Children with high-functioning autism who are capable of higher intellectual functioning and who have the ability to speak are more easily socially adaptable (Baron-Cohen, 2001).

All children on the autism spectrum disorder have serious speech and language disorders. Even children who have developed speech properly rarely use it in verbal communication (Поповић-Деушић, 1999).

Abnormalities in understanding the mind is one of cognitive characteristics of disorders on the autism spectrum. Children on the autism spectrum disorder show difficulties in regard to socio-cognitive abilities. A series of surveys conducted over the last thirty years have suggested that children on the autism spectrum disorder develop their minds much later than children who develop in a typical manner (Baron-Cohen, 2001; Colle, Baron-Cohen, Hill, 2006; Perner, Frith, Leslie, Leekam 1989; *Happé*, 1999).

There is an early imitation deficit in the development of children with autism (Charman, et al., 1997). The majority of research into the recognition of emotions (basic emotions - joy, sadness, fear, anger, surprise) have revealed deficits in individuals on the autism spectrum disorder, compared with neurotypical children or other clinical groups.

Distinguishing appearances from reality, which is considered to be the pivotal point in the development of theory of mind, is very problematic in children on the autism spectrum disorder. This distinction between appearance and reality forms a basis for the distinction between the mental and the physical, which follows the distinction between I and others (Baron-Cohen, 2001; Frith, *Happé*, 1999). During the task that examines this, the child listens to a story where one participant has a mental experience (thinking about a dog), while another participant has a physical experience (holding a dog). The task of the child is to answer which of the participants can caress the dog. Neurotypical children between three and four years of age answer this question with no difficulty, while children on the autism spectrum disorder make mistakes during this task (Baron-Cohen, 2001).

Four-year old neurotypical children distinguish appearance from reality, and if they are presented with a candle in the form of an apple, they are able to tell appearance and reality apart and say it is the apple-shaped candle. Children on the autism spectrum disorder make mistakes about presentations like this and mistake the candle for fruit. In such a task, children should be able to recognize the appearance of the object as opposed to what it really is, that is, to distinguish between the subjective perception and objective reality, which is an additional indicator that autism has a deficit of theory of mind.

Neurotypical children at the age of three understand the principle - I see, therefore I know. Consequently, neurotypical children can fulfil a task involving one participant looking at a box while the other participant is just touching a box, and the question for the child to answer is which participant knows what is in the box. Children on the autism spectrum disorder fail to complete these tasks. Likewise, the neurotypicals at the age of three and four begin to use and recognize verbs describing mental states, such as I mean, I know, I want, I hope. Children on the autism spectrum disorder show difficulty in understanding and distinguishing mental from non-mental verbs, e.g. jump, eat, and walk (Perner, Frith, Leslie, 1989; Baron-Cohen, 2001).

Children on the autism spectrum disorder have difficulty understanding other people's gaze. Although they may answer the question of what a person is gazing at, they are unable to relate their gaze to mental states, such as desires. Neurotypical children can understand what a person wants based on their gaze direction (Baron-Cohen, 2001).

Delays and deviations in the development of understanding of the theory of mind can be one of the symptoms of various developmental difficulties and disorders. In children on the autism spectrum disorder, abilities relating to the development of theory of mind, such as joint attention, pretend play, reduced ability to imitate, are absent. This absence of abilities relating to the development of the theory of mind is seen as indicative of disorders on the autism spectrum (Baron-Cohen, 1997). When it comes to autism spectrum disorders, there is a developmental delay in theory of mind, which has been confirmed in the meta-analysis by Happé. She confirmed that children on the autism spectrum disorder who are verbally at the age of twelve successfully complete the task involving false beliefs that neurotypical children successfully fulfil at the age of about four (Happé, 1999).

According to Peterson, Wellman, and Lui (2005), understanding false beliefs goes through different stages in neurotypical children: diversity of desires (understanding desires), diversity of beliefs (understanding beliefs), understanding the origin of knowledge (to see means to know), wrong beliefs (understanding wrong beliefs), and latent emotions (understanding latent emotions). Research into these stages in children on the autism spectrum disorder has shown that the first three stages of development are no different in neurotypical children, but that the situation is different in the last two stages. In children on the autism spectrum disorder, an understanding of latent emotions develops first, which is followed by an understanding of false beliefs. This is corroborated by the interpretation that understanding false beliefs is more difficult for children with this spectrum of disorders.

Social Factors and their Impact on the Development of Theory of Mind

Surveys have identified a number of causes associated with individual differences in the occurrence and quality of understanding of mental states. The causes are gender, age, but also different conditions in the child's social environment. Studies that have examined the impact of gender on the development of theory of mind indicate that three-year old girls are far ahead of boys in their ability to predict other people's mental states. Girls perform better at standard mind theory tasks than boys, while boys are better at this than girls and boys on the autism spectrum disorder (Happé, 1999). Research dealing primarily with the influence of gender on theory of mind has suggested that girls are better at distinguishing emotions (appearance-reality), as well as understanding other people's motives. This difference in theory of mind with particular regard to gender mostly loses its strength as the child grows older (Charman, Ruffman, Clements, 2002). There is a linear relationship between the number of siblings and the outcomes of tasks involving false beliefs. Children who have more than two siblings performed better in such tasks than children with one sibling, and they performed better than children with no siblings. Children who have older siblings (Barr, 2008; Ruffman, Perner, Naito, Parkin, Clements, 1998) have a better understanding of theory of mind. There is a stark contrast between the findings involving pre-school neurotypical children and findings suggesting that growing up with older siblings has a negative effect on the development of theory of mind in children on the autism spectrum disorder. It is likely that older siblings consciously or unconsciously make up for the deficit of their younger siblings with autism, thereby hampering their social-cognitive development (O'Brien, Slaughter, Peterson, 2011). There is ample evidence suggesting that parent-child interaction, and conversations about mental states from early childhood, are important factors in the development of theory of mind. Such findings are consistent for both groups of children, both neurotypical and children on the autism spectrum disorder (Slaughter, Peterson, Mackintosh, 2007; Ruffman, Slade, Crowe, 2002; Taumoepeau, Ruffman, 2006). Children whose parents' educational and disciplinary measures involve talking to and encouraging their children to think about the emotions of others show a greater ability to gain a perspective on themselves and others (Ruffman, Perner, Prakin, 1999). Studies have shown that children coming from lower socio-economic backgrounds have a better interpersonal theory of mind, whereas, in contrast, children on the autism spectrum disorder have a better intrapersonal theory of mind (Westby, 2014). Middle-class children show a better theory of mind than children whose parents belong to the working class. Certain studies have shown that the development of theory of mind and its complexity depend on the educational background of the person being the primary guardian of the child (Cutting, Dun 1999). As for the family structure, children from

single-parent families differ in terms of theory of mind from children living with both parents (Pears, Moses, 2003).

Assessment of Theory of Mind

Assessment of theory of mind in early childhood is based on several approaches, ranging from individual tasks or a number of tasks examining the understanding of particular mental states; another approach implies the use of battery of tasks examining the understanding of a range of mental states. In addition to these approaches to the development of theory of mind in children, it is possible to draw conclusions from the child's spontaneous speech, as well as from the evaluation of the child's parents or guardians.

Most tasks assessing the understanding of mental states are based on the use of different props to help present characters in a story to children who are then asked to identify, explain, or predict the mental state of the characters in the story.

As for emotion comprehension tests, tasks are used in which the child is presented with emotion drawings and is asked to recognize the emotion from the drawing or photograph or to predict what emotion a person will experience in a given situation. Generally speaking, such tasks are based on recognizing basic emotions (joy, sadness, anger, fear) referring to drawings of facial expressions (so-called expressive naming), or correct identification of facial expressions that correspond to each emotion (so-called receptive naming).

When it comes to the assessment of false beliefs that has been identified with theory of mind for a long time, the most common and well-known tasks are false-belief tasks. The most popular task and the most used one in research is the unexpected location-change task, the "Sally-Anne" task (Baron-Cohen, Leslie, Frith, 1985).

There are also more complex batteries, both in terms of form of tasks and questions, and due to the fact that they are intended for older children. Some examples of such batteries include *Strange Stories* (*Strange Stories*, Happé, 1994), *Stories from Everyday Life* (Kaland et al., 2002), ToM picture books such as the instrument we used in our research.

There is also an approach based on parental assessment of the degree of development of theory of mind. This approach is supported by the ToMI-2 inventory used in this research.

RESEARCH METHODOLOGY

Surveys conducted over the last thirty years have suggested that all children on the autism spectrum disorder have deficits in theory of mind and that they either do not develop this ability or acquire it much later than neurotypical children. The assessment of theory of mind in children

from this clinical group may yield important diagnostic criteria in the practical work of clinical psychologists.

The primary objective of the research is to examine differences in the ability to recognize mental states and activities in themselves and others in neurotypical development and children on the autism spectrum disorder. The secondary objective of the research is to examine individual differences in theory of mind in neurotypical children and children on the autism spectrum disorder in relation to socio-demographic characteristics (gender and age of the child, family structure, number of siblings, educational background and socio-economic status of parents, time parents spend with the child and time the child spends in pre-school).

Hypotheses:

Hypothesis 1: There is a difference in the development of theory of mind in neurotypical children and children on the autism spectrum disorder.

Hypothesis 2: There is a difference in the abilities of theory of mind in neurotypical children and children on the autism spectrum disorder in relation to socio-demographic characteristics: 1. gender; 2. age; 3. family structure of; 4. number of siblings; 5. parents' educational background; 6. parents' socio-economic status; 7. time parents spend with their child; 8. time the child spends in pre-school.

Variables:

Research design belongs to a group of correlation designs. The dependent variable is the ability of theory of mind defined as the ability to attribute mental states such as desires, intentions, beliefs, to oneself and others which has been operationalized as a measure of success in completing tests from a battery of tests for children /Theory of mind task battery (Hutchins, Prelock, 2014)/, as well as the overall score on the theory of mind inventory for parental assessment of the development of theory of mind in the child /Theory of mind inventory- TOMI-2, (Hutchins, Prelock, Bonazinga, 2016)/.

Independent variables are as follows:

Belonging to a group of respondents, a group of neurotypical children and a group of children on the autism spectrum disorder, and socio-demographic variables, gender (male gender - 102 respondents and female gender - 64 respondents), age of respondents (children between 4 and 15 years of age), family structure (single-parent and two-parent family), number of siblings, birth order, mother's and father's educational background (primary, secondary and college education), parents' employment status (full-time job, part-time job, and unemployed, as well as two fathers who are retired), parents' socioeconomic status (much worse than average, worse than average, average, better than average, much better than average), number of

family members, the time parents spend with their child (as a numerical measure of average time parents spend with their child on a daily basis), the age at which a child begins attending pre-school.

Sample

The research sample is appropriate. The survey involved pre-school neurotypical children (between 4 and 6 years of age) with their parents, and the children on the autism spectrum disorder (pre-school and school children between 4 and 15 years of age due to the expected delay in the development of theory of mind) with their parents. The total number of children is 166. The number of the neurotypicals is 103. The number of children on the autism spectrum disorder is 63.

Instruments

So as to test the development of theory of mind, we used two instruments adapted for the purpose of survey: task battery for theory of mind for children (Hutchins, Prelock, 2014)/, and Theory of mind inventory for parents / Theory of mind inventory- TOMI-2, (Hutchins, Prelock, Bonazinga, 2016)/. Using both instruments enables drawing a comparison of the measures of findings obtained from the development of theory of mind on both instruments and thereby a better assessment will be carried out. As for collecting data, we used a demographic questionnaire designed for parents and drawn up for the purpose of survey.

Instrument for assessing the theory of mind completed by parents - Theory of mind inventory - TOMI-2, (Hutchins, Prelock, Bonazinga, 2016), translated into Serbian. The inventory consists of 60 items designed to capture a wide range of socially cognitive views of a child. Each of the 60 items belongs to one of the three levels (early, basic, and advanced). The early development level of theory of mind contains items referring to gaze management skills, and joint attention in social interactions. The basic developmental level of theory of mind that usually emerges at the pre-school age of children refers to the abilities of the origin of knowledge, and of first-order false beliefs. The advanced development level contains items related to the ability to understand second-order false beliefs. There are also three subscales within the main subscales, the emotion recognition scale, the mental state understanding scale, and the pragmatism scale.

Theory of mind task battery for children (Hutchins, Prelock, 2014), translated into Serbian, consists of 15 questions within 9 tasks. The tasks are presented as a picture book and ranked in order of difficulty. The tasks vary in content and complexity, and contain the ability to recognize facial expression (recognition of basic emotions-fear, joy, sadness, anger), and tasks dealing with the ability to draw conclusions about second-order false beliefs. The tasks are presented in the form of a story, accompanied with lively

illustrations. The task battery is designed to assess the theory of mind of younger and older children that differ in cognitive and verbal profiles. The task battery is also suitable for people with language deficits. In the course of surveys using the task battery as an instrument for measuring theory of mind, the task battery showed excellent internal consistency as measured by the Cronbach coefficient, $\alpha=.91$ to $\alpha=.94$, as an excellent test-retest reliability, both in neurotypical and children on the autism spectrum disorder (Hutchins, Prelock, Chase, 2008; Hutchins, Prelock, Morris, Benner, La Vigne, Hoza, 2016).

In the course of translating and adapting the inventory, we used double translation; the inventory was translated into Serbian first and then to the original, English language of the instrument. A pilot survey was then conducted to check the intelligibility of the inventory for parents and to get feedback on the items in the inventory. The research first examined the psychometric characteristics of the inventory and task batteries – reliability ($\alpha=.98$ for Inventory, $\alpha=.84$ for battery), constructive and criterion validity. The exploratory factor analysis verified the constructive validity of the inventory, while measures of correlation of the inventory with tasks from the battery tests determined its criterion validity.

Processing of Results

The IBM SPSS Statistics statistical software package was used to process the data. To test the research hypotheses, we used t-test for independent samples and Kruskal-Wallis test.

Findings of the Survey

Findings of the survey suggest that there is a statistically significant difference in the average values of the theory of mind as measured by both the battery of tasks ($t=18,3$ $df=164$ $p<0.001$) and the inventory for parents ($t=14,06$ $df=113,9$ $p<0,001$) in relation to the group to which the child belongs (the group of neuro-typical children and the group of children on the autism spectrum disorder).

There is no difference in the average values of the theory of mind in relation to gender or family structure in both groups of children (neurotypical children and children on the autism spectrum disorder).

There are statistically significant differences in the ability of theory of mind in relation to socio-demographic variables in two groups of respondents examined, groups involving neurotypical children and children on the autism spectrum disorder. In neurotypicals, there are substantial differences in the ability of theory of mind in relation to the age of a child, the mother's educational background, the father's educational background, the mother's employment status, the father's employment status, the number of children,

the number of family members, the socioeconomic status, time parents spend with their children.

As for children on the autism spectrum disorder, there are marked differences in the ability to attribute mental states with regard to age, the mother's employment status, and number of children in the family.

Table 1. Differences in performance on theory of mind tasks according to socio-demographic variables - Kruskal-Wallis test

	Neurotypical children						Children on the autism spectrum disorder					
	Tom-battery for children			Tomi-inventory for parents			Tom-battery for children			Tomi-inventory for parents		
	χ^2	df	p	χ^2	df	p	χ^2	df	p	χ^2	df	p
Age	22,13	2	.000	40,96	2	.000	4,36	4	.359	9,61	4	.047
Parents education	21,99	2	.000	7,42	2	.024	5,83	3	.120	4,48	3	.214
Parents employment	11,2	2	.004	12,8	2	.002	3,90	2	.003	4,00	2	.003
Number of children	17,1	3	.001	15,5	3	.001	1,43	3	.699	9,71	3	.021
Number of family members	17,83	4	.001	9,93	4	.042	6,82	6	.338	8,18	6	.225
Socio-economic	30,41	4	.000	11,28	4	.024	7,73	4	.102	4,46	4	.348
Time spend with child	10,58	11	.479	21,75	11	.026	3,89	9	.918	12,99	9	.163

INTERPRETATION AND DISCUSSION OF FINDINGS

Hypothesis 1: This hypothesis has been confirmed. Preschool-age neurotypical children have a far better theory of mind than children with autism spectrum disorder, irrespective of age. Measures of the average values of the theory of mind, measured using both instruments, show that the average values are higher in neurotypical children than in children with autism spectrum disorder. Even when we compare the average values of theory of mind in order of development, we see that the values of theory of mind at the early and basic level are higher in neurotypical children.

Arithmetic mean analyses have shown and confirmed the hypothesis that neurotypical children are superior in their ability to attribute mental states to themselves and others to children on the autism spectrum disorder. The regression analysis has shown that belonging to a sample group is an excellent predictor of the value of theory of mind because 67% of variations in values of theory of mind can be explained only by the group to which a child belongs.

Hypothesis 2: If we look at the total sample of differences between boys and girls based on the ability of theory of mind, there are differences in terms of *gender*. However, if we look at the ability of theory of mind by groups of our sample, there are no gender differences in terms of theory of mind, neither in neurotypicals, nor in children on the autism spectrum disorder, regardless of the measurement method used. In terms of *age*, the hypothesis has been confirmed on the sample of neuro-typical children and on the sample of children with autism spectrum disorder, as well as on the total sample. In both groups, there is a statistically substantial difference in the mean values of theory of mind measured by both instruments with respect to the respondents' age. The correlation analysis has also shown there is a connection between theory of mind and age, and the regression analysis puts age in the second place within the predictive model. Connection between theory of mind and child's growing up in relation to the family structure (single-parent family or two-parent family) has not been confirmed in our sample. In view of the *number of children in the family*, the hypothesis on the sample of neurotypical children has been confirmed (there is a statistically considerable difference in arithmetic means between neurotypical children in relation to the number of children in the family, but not in order of birth of children in the family). In children with autism spectrum disorder, the presence of siblings shows no connection with the abilities of theory of mind. In view of the socio-economic status of the family, the hypothesis has been confirmed on both the sample of neurotypical children and the sample of children with autism spectrum disorder when the ability of theory of mind was measured using the inventory for parents. Better socio-economic status is associated with better theory of mind, whereas the situation with parents' employment status is different. With regard to the theory of mind measures, as measured using the battery of tasks on the total sample, there is a negative connection with *the parents' employment status*. Children whose parents do not work have a better theory of mind (the parents' employment status is closely linked to the amount of time parents spend with their child). These results in children with autism spectrum disorder are not consistent with those of neurotypical children. This can be explained by the fact that the parents' employment status may be an indicator of the severity of symptoms of the child's autistic disorder. More severe symptoms of the disorder imply that the child needs more time and care, and this deprives parents of having a permanent job, as a result. In view of the *level of education of father and mother*, the hypothesis has been confirmed on the total sample, regardless of the methodology of measurement of theory of mind. Educational background of both mother and father is moderately positively correlated with a child's ability to attribute mental states to himself/herself and others. It is worth noting that a better predictor of theory of mind in both neurotypical children and in children with autism spectrum disorder is the mother's educational background (a higher level of mother's education is associated with a better

ability of a child's theory of mind). Regarding the average time spent by parents on a daily basis with their children on the overall sample of children, the correlation analysis has indicated that there is a slight negative correlation between the average time spent by parents with their children on a daily basis. These findings imply that children whose parents spend less time with them have a better developed theory of mind. These findings are inconsistent with both theoretical and empirical foundations, for it is through social interactions with their parents that children develop the ability to attribute mental states to themselves and others. The findings obtained in the overall sample can be explained primarily by the number of parents of children on the autism spectrum who have spent many hours with their children on a daily basis, and their capacity for theory of mind remains undeveloped. If the parent does not have to spend time with the child constantly, this implies that the child on this spectrum of disorders is more independent, more functional and does not need constant parental care. The hypothesis concerning the *age at which a child begins to attend pre-school or day-care centres for children with disabilities* correlates positively with the development of theory of mind. This hypothesis has been confirmed on the entire sample. There is a correlation between theory of mind and the age at which a child starts attending pre-school and day-care centres. Children who enrol in educational institutions at an early age show better theory of mind. When we compared the groups of children to assess whether this hypothesis makes sense, we concluded that the age at which the child starts going to pre-school shows greater connection with theory of mind in neurotypical children, whereas in children with autism spectrum disorder this connection was not noticed.

CONCLUSION OF THE SURVEY

There are differences in theory of mind between neurotypical children and children with autism spectrum disorder. Neurotypical preschool-age children are far ahead of preschool-age and school-age children with autism spectrum disorder. This difference is visible not only in relation to the total measure of theory of mind, but also in the level of development of theory of mind. All neurotypical children at the age of four are at the basic level of theory of mind, whereas preschool-age and school-age children with autism spectrum disorder are either at the early level of theory of mind, or the basic level of it.

The comparison of the ability of theory of mind in neurotypical children and children with autism spectrum disorder and socio-demographic variables indicates that the findings for the two groups do not coincide. The impact of socio-demographic variables is more pronounced in neurotypical children than in children with autism spectrum disorder. Thus, the presence of siblings has been shown to correlate positively with theory of mind in neurotypical children, whereas there is no such connection in children with

autism spectrum disorder. The socio-economic status of the family may be related to theory of mind in neurotypical children, whereas the socioeconomic status exerts no influence on theory of mind in children with autism spectrum disorder. The parents' education, above all the mother's education in neurotypical children, positively correlates with theory of mind, as children whose parents are educated show a better developed theory of mind, but this correlation is not found in children with autism spectrum disorder. Time parents spend with their neurotypical children slightly correlates positively with theory of mind, but the situation is completely different with regard to children with autism spectrum disorder. These children whose parents spend more time with them have a less developed theory of mind. This can be explained by the fact that the severity of autism symptoms dictates how much time parents spend with their child. If a child requires constant care, the symptoms are more severe, and therefore the possibility of developing theory of mind is reduced. The age at which neurotypical children start attending preschool is associated with better theory of mind. Early socialization, as well as early interaction with peers, contribute to a faster development of the ability to attribute mental states to oneself and others. In children with autism spectrum disorder, there is no correlation between theory of mind and the age at which a child begins to attend preschool.

CONCLUSION

In conclusion, we will briefly emphasize the following theoretical and practical contributions of this paper:

Its theoretical significance is reflected in the fact that Theory of Mind in relation to Psychology of Childhood and Youth and Psychopathology of Children and Young People (within the classical approach) and Ecology of Human Development and Ecological Child Psychology (within the ecological approach, which understands development in terms of function of environmental influences) provides a new theoretical framework/approach defined as the ability to attribute a range of mental states (desires, intentions, feelings) to oneself and others, and the use of this information for explanation and prediction of behaviour (Baron-Cohen, 2001; Barr, 2008). We use theory of mind to explain our behaviour to others by saying what we think and feel, and we also use theory of mind to interpret the behaviour of others by attributing desires, intentions, feelings, beliefs to them. Theory of mind is one of the essential abilities that makes us human (Whiten, 1993, according to Baron-Cohen, 1998). Theory of mind has made a major contribution, in comparison to previous approaches, by allowing only visible developmental behaviours to be overcome (it is built step by step through interactive social experiences). A new theoretical approach also provided new instruments such as those used in practice, and which we used in our survey. The instruments used in our sample (to test the development of theory of mind we

used two instruments adapted and validated for research purposes: Theory of mind task battery (Hutchins, Prelock, 2014), and Theory of mind inventory - TOMI-2, (Hutchins, Prelock, Bonazinga, 2016) have proven to be highly reliable and adequate, as well as good at drawing a distinction between theory of mind in neurotypical children and children with autism spectrum disorder.

a. Its practical importance is reflected in the fact that, thanks to the methodological principles of the clinical approach in Psycho-diagnostics, whose principles are as follows: groups as a framework, “openness” of Psycho-diagnostic battery, multidimensionality, favouring wide-range techniques, exploration/research and other principles, we are able to enrich Psycho-diagnosis of children and young people, apart from the old instruments.- In the past, the diagnosis of developmental disorders, primarily on the spectrum of pervasive disorders, was established through behavioural criteria)¹ with the abovementioned new instruments used to assess the development of theory of mind, based on this research and years of personal experience of working with children and young people.

b. Its practical importance is reflected in the fact that, thanks to early diagnosis, especially of developmental disorders on the autism spectrum, we can provide guidelines for psychological and defectological treatment (to approach early stimulation of development, as well as defectological treatment, above all speech therapy, because we have seen that empirical data indicate a clear link between verbal abilities and theory of mind) and parent counselling to help them improve their socio-cognitive functioning. Parent counselling on how to strategically use practical research findings in accordance with theory of mind, or how to discover that there are mental states that cannot be observed directly. Parents can be informed how to gain perspectives and intentionality through imitation and joint attention, develop understanding of both their own thoughts and thoughts of others, emotions / through recognition of basic emotions (joy, sadness, anger, fear), desires, intentions, knowledge, beliefs and wrong beliefs. Also, Parents can

¹ The Behavior Observation Scale for Autism (B. J. Freeman , E. Ritvo, O. Guthrie, P. Schroth and J. Balla); BRIAAC – A Handbook with Scale and Instructions - the Behavioral Rating Instrument for Autistic and other Atypical Children/ Bertram A. Rutterberg, Beth I. Kalish, Charles Wenar, Enid G.Wolf); Social Behavior Questionnaire for children up to six years of age, Social Behavior Questionnaire for children above six years of age (Milačić, I); Diagnostic criteria for Asperger syndrome according to Gilberg and Gilberg (1989), Diagnostic criteria for Asperger syndrome according to Szatmari, Brennerand and Nagy (1989), Diagnostic criteria for Asperger disorder according to ICD – 10 WHO, 1993, Diagnostic criteria for Asperger disorder according to DSM IV and DSM V (According to Diagnostic and Statistical Manual of Mental Disorders (DSM-5), a guidebook written by American Psychiatric Association and used to diagnose mental disorders, people with ASD have: difficulties communicating and interacting with others, limited interests and repetitive behavior, symptoms that impair the person’s ability to function properly in school, work, and other fields of life); ADOS (Autism Diagnostic Observation Schedule, (Corsello, Akshomoff and Stahmer).

be advised how to use a range of causes of social factors associated with individual differences in the appearance and quality of understanding of mental states in a constructive way. The causes are gender, age, but also different conditions in a child's social environment (family: the parent-child interaction and conversation about mental states from early childhood are important factors in developing theory of mind; the parenting style and disciplinary measures teach and encourage children to think about emotions of others thereby showing a better ability to get a perspective on themselves and others; the socioeconomic status as a cause shows that children from lower socioeconomic backgrounds have a better interpersonal theory of mind, whereas, in contrast, children with autism spectrum disorder have a better intrapersonal theory of mind; some studies have shown that the development of theory of mind and its complexity depend on the education of the person who is the primary guardian of the child; children coming from single-parent families also differ in terms of theory of mind from children coming from two-parent families, including the amount of time parents spend with their child, and time a child spends in institutions, kindergarten, playrooms, clubs, preschool and school, as well as social and cultural variables.

c. Its practical importance is also reflected in the fact that, having accepted the definition of a person as a biological, psychological and social being, and understanding the importance of a person's social functioning for the purpose of better and successful adaptation to society, on the one hand, and theory of mind as the ability to attribute mental states to oneself and others which enables better social functioning and adaptation on the other hand, as well as realizing that this ability can be crucial for social functioning of both neurotypical persons and persons with autism spectrum disorder and facilitate their integration into society and improve their interpersonal relationships. If biological capacities allow it, we are to work on developing better theories of mind by teaching children emotional and social skills in order to protect and improve the mental health of children / youth and their families and enhance their quality of life.

d. Finally, we hope that we have also made some practical contribution to a better understanding, explaining and predicting the behaviour of children and young people without and with developmental psychiatric disabilities.

It should be observed that there are certain limitations within the survey. The survey was carried out on a limited sample. Future research might benefit from some of the implications of this paper. The instruments used to measure the ability of theory of mind should be standardized for our population, a larger number of respondents should be questioned, a more uniform sample based on all socio-demographic variables should be used, and the association of theory of mind with other abilities, such as verbal intelligence should be examined.

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ДОПРИНОС И ИМПЛИКАЦИЈЕ ТЕОРИЈЕ УМА: ДЕЦА УРЕДНОГ РАЗВОЈА И ДЕЦА ИЗ АУТИСТИЧНОГ СПЕКТРА ПОРЕМЕЋАЈА

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Резиме

Прегледом стручне литературе може се видети да је на српском језику врло мало теоријских и истраживачких радова који се баве теоријом ума, иако се она у свету истражује већ тридесетак година. У том смислу, значај овог рада јесте упознавање са теоријским и емпиријским сазнањима о социо-когнитивном развоју по теорији ума деце уредног развоја и деце из аутистичног спектра поремећаја, упознавање са фазама и нивоима развоја теорије ума и разликама у теорији ума деце уредног развоја и деце из аутистичног спектра поремећаја. У раду ћемо се осврнути и на утицај социјалне средине у којој дете одраста и демографских карактеристика на развој теорије ума.

Практични значај рада огледа се пре свега у адаптацији инструмента за процену теорије ума на српски језик, а чија стандардизација треба да буде следећи корак, с обзиром на недостатак такве врсте инструмента код нас, који се може користити у истраживањима, али и у индивидуалној процени како би се одредио достигнут ниво развоја теорије ума и код деце типичног и атипичног развоја. Практични значај рада, односно истраживања, јесте и у новом приступу у психодијагностици деце и младих јер нам даје увид у профил теорије ума код особа из аутистичног спектра поремећаја који може у клиничком раду да издвоји ову групу поремећаја и њене специфичности у погледу теорије ума и да нам да смернице за психолошко-дефектолошки третман и саветодавни рад са родитељима у циљу побољшања њиховог социо-когнитивног функционисања.

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