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# PSYRGGU 2020 Psychology of Personality: Real and Virtual Context

# FACTORS OF SCHOOL ADAPTATION IN CHILDREN WITH SPECIAL NEEDS

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## Abstract

The article considers the mutual relations of theory of mind (ToM), behavioral control and school adaptation. Behavioral control is assessed by the task of combining attributes, Yes-No task, naming and classification emotions, the Test of Child Anxiety by Tamml, Dorky and Aman and a series of neuropsychological tasks. Theory of mind is assessed by the following tasks: visual perspective understanding tasks, the first- and second-order false belief task, the understanding of deception and "white lie". Intelligence is assessed by the Wechsler Intelligence Scale for Children. 24 children with special needs 7-8 years old (90-108 months old, 16 males) from first grade of school had participated in the study. The current study found that theory of mind and behavioral control were actually associated with the success of adaptation to school, academic success, social competence. Children who were better in ToM tasks also had better academic achievements; children with higher behavioral control were better in general adaptation and had greater social competence.

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## 1. Introduction

The nature of the cognitive, emotional, personal development of a child with disabilities can seriously complicate his ability to adapt to new situations, understand the situational context, and choose methods of action.

The beginning of school education makes serious demands on the adaptive abilities of children - children enter a new social and physical environment, meet unfamiliar adults, have to learn new rules, etc. In this situation, the ability to regulate one's behavior, coping with negative emotions, the ability to subordinate one's behavior to the rules, and the ability to understand other people's mental world, their beliefs, emotional states, deception, etc. acquires particular importance.

The ability to regulate behavior is considered in the framework of the concept of behavioral control. Behavioral control, being the psychological level of behavior regulation, is based on the intellectual, emotional and volitional abilities of the subject, which form an individual pattern of self-regulation (Sergienko & Vilenskaya, 2018).

We consider social competence through the theory of mind. Theory of mind (ToM) is the ability to attribute and understand the mental states of other people to predict and explain their behavior (Baron-Cohen, 2000; Sergienko et al., 2009). The ability of understand the mental states of other people is a complex social and cognitive skill that develops from early childhood to late adolescence. Theory of mind can be manifested not only in the communication, but also in the social competence, the social interaction, including the manifestation of empathy, the ability to understand various types of deception, influence the mental states of other people (be able to persuade, manipulate). And these complex social and cognitive skills can manifest themselves especially clearly when a social situation changes, for example, in connection with the beginning of school education.

## 2. Problem Statement

In recent years, the number of studies on the relationship between understanding the social world and academic performance of children has increased sharply (Imuta et al., 2016; Lecce et al., 2017; Lockl et al., 2017; Wellman, 2016). In early studies, causal relationships were found between emotion recognition, understanding their causes and children's school achievement (Denham et al., 2012; Shields et al., 2001). The results of recent studies have shown the relationship of the theory of mind and social competence as an indicator of peer's relation and further children's school achievement. The results of a longitudinal study showed that children's recognition of emotions and understanding of false beliefs at 5 years old predicted their social competence (peer's relation and socially acceptable behavior) at 7 years old and performance of tests on reading and mathematics at 8 years old (Lecce et al., 2017). Same data were obtained in another longitudinal study: theory of mind's tasks performance at 4 years old correlated with test results of math and teachers' assessments of children's social and emotional abilities (including cooperative abilities, severity of aggressive behavior, and emotional self-regulation) (Lockl et al., 2017). However, there are not so many studies on the relationship between school adaptation, academic achievement, social competence, and theory of mind's tasks performance of children with special needs. Most studies showed the relationship

between social skills and theory of mind in children with autism spectrum disorders (ASD) and children with intellectual disabilities (Borisova, 2019; Smogorzewska et al., 2018; Yukselen & Yaban, 2013).

Regulatory skills considered as an essential component of school readiness (Blair, Raver, 2015; Gutkina, 2000; Purpura et al., 2017). The role of executive functions as a cognitive component of self-regulation has also been confirmed by many studies. The ability to inhibit impulsive behavior is a key factor for academic performance (Borella et al., 2010; Bull & Scerif, 2001; D'Amico & Passolunghi, 2009). Most studies are devoted to finding the relationship between executive functions and the success of children in school. In particular, some studies noted the role of attention (Duncan et al., 2007, McClelland et al., 2013), including the ability to switch it from one task to another (Blair & Razza, 2007), combined with the ability to inhibit irrelevant behavior.

In children with special needs, in particular, with mild intellectual disability, specific self-regulation disorders were observed: lack of interest in tasks, lack of formation of an intellectual action, the tendency to apply previously acquired skills and abilities stereotypically without taking into account the conditions of the task, lack of critical attitude to their actions, impulsivity, inattention (Ul'enkova, 1994). Significant variability in the regulatory abilities of children with mild intellectual disability was also found, with the most serious lag in the affective-motivational and volitional components of self-regulation, as well as a lack of flexibility and initiative (Kisova, 2013).

All of the above makes the investigation of the others' mental world understanding and the selfregulation as possible resources for school adaptation of children with special needs important and necessary.

### 3. Research Questions

Does the success of performance of theory of mind and behavioral control tasks relate to the successful adaptation of children to school, their academic achievements and social competence?

## 4. Purpose of the Study

The aim of this study is the investigation of relations between the development of the behavioral control and ToM on the one hand and school adaptation estimated by teachers on the other hand in children with special needs.

#### 5. Research Methods

#### 5.1. Subjects (cases)

Data were collected and analysed on 24 first-year students with special needs (SN) studying in the 1st grade. The characteristics of the group are presented in Table 01.

Age (mo) Median (Range)	Gender (M:F)	Special needs	Verbal IQ Median (Range)	Performance IQ Median (Range)	Full scale IQ Median (Range)
95 (90-108)	16:8	Children with mild disorder of intellectual development - 17; Children with language disorders – 3; Children with ASD – 4	81,5 (60-124)	100 (72-146)	89,5 (65-124)

Table 01. Demographical and intellectual characteristic	s of children/
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#### 5.2. Methods

The tasks to understand the visual perspective of second levels, to understand the first and second order false beliefs (similar to "Sally-Anne test" and "Ice-cream test") and two stories from "Strange story" (deception and "white lie") (Baron-Cohen, 2000; Happe, 1994) were used to assess theory of mind. All the variables of ToM were measured based on dichotomous scale: 0 = the task was not performed correctly; 1 = the task was performed correctly. Overall score of theory of mind was the sum of all tasks performed (The Cronbach 's alpha is 0.714).

To estimate the cognitive control we used the Kogan's task of combining attributes (Bleyher & Kruk, 1986) and "Tower of Hanoi".

Kogan's task examines child's abilities to focusing, shifting and maintain attention. During this task a child asked to sort cards with different geometric shapes by different colours (with preliminary series when child just counts cards), first – by colour, then – by shape and in final series a child has to put them in special table considering both colour and shape. The experimenter recorded time for each series and a number of mistakes in counting and/or sorting.

The "Tower of Hanoi" is well-known puzzle, frequently used in psychological research on problem solving. We registered time spent on solving a task and an number of moves.

To estimate the emotional control, we took "Child anxiety test" by R. Tamml, M. Dorky, B. Aman (as cited in Praktikum..., 2001) and "ABC of mood" by Belopolskaya (2006). We modified "ABC of mood" for investigating purposes. A set of pictures with images of people and animals (a man, a woman, a cat, a bird) with different moods (a joy, an anger, a fear, a grief, a discontent, a complacency) was selected. Each picture presented to a child and we ask about depicted character: "What is his\her mood?" After that, we mix the pictures and ask children to arrange the pictures to piles that in each pile there were images of people and animals with the same mood. Then we ask children to name mood of characters in each pile. We assess the correctness of name of emotion (synonyms estimated as right answers, for example, angry, annoyed, etc. are correct answers). Also we estimated the correctness of emotion classification by how much it coincides with the classification of the author of the "ABC of mood". In both cases an amount of errors is accounted.

The control of actions was estimated by means of neuropsychological tasks (for reciprocal hand movement, repetition of rhythmic sequence and a task "Fist-Rib-Palm" for execution of a sequence of actions – two sequences for each hand) (Akhutina, 2016). Max score was 6.

The questionnaire for teachers was used to assess the degree of school adaptation of children with special needs. Teachers evaluated child adaptation in five areas on a 10-point scale - general adaptation to school, academic achievement, problem behavior, peer's relation, and adult's relation. All scales, except for the scale of problem behavior, were direct, i.e. a higher score meant better child adaptation.

Wechsler Intelligence Scale for Children (WISC) was used to assess the level of intellectual development of children with SN. Eight subtests were used, four in each verbal and non-verbal test series, which allowed calculating the Full-scale IQ, Verbal IQ and performance IQ (Filimonenko & Timofeev, 2006).

For statistical analysis we used Statistica 6.0. and SPSS 19, with nonparametric Spearman rank order correlation. We used Fisher's angular transformation criterion ( $\phi$ ) and Mann-Whitney criterion (U) to determine the differences in the success of performing certain tasks on theory of mind.

# 6. Findings



#### 6.1. School adaptation's assessment

Figure 01. Results of school adaptation's assessment (median) of children with special needs

According to our findings presented in Figure 01, teachers' assessments of the general school adaptation of children, their skills of peer's and adult's relations are quite high, but their school achievement and the lack of problematic behavior at school are somewhat lower.

Correlations were found between general school adaptation and the success of peer's relation (r = 0.910, p = 0.000) and adult's relation (r = 0.445, p = 0.064 - at the level of the trend), which says that teachers rely on assessing the child's adaptation in school at primarily on his skills in interacting with people, his social competence. Our data can be confirmed by results of study of Lithuanian schoolchildren, whose indicate that teacher perception of social competence is an important factor in teacher perceptions of school adaptation in the 1st and 2nd grades of elementary school (Magelinskaitė-Legkauskienė et al., 2018).

## 6.2. Behavioural control's tasks performance

The data of behavioral control's task performance are shown in the Table 02.

Tasks	Median	Minimum	Maximum
Task of combining attributes series 1	48,0000	25,000	131,0000
Task of combining attributes series 2	59,0000	35,000	292,0000
Task of combining attributes series 3	90,0000	47,000	435,0000
Task of combining attributes series 4	177,5000	41,000	657,0000
Errors series 1	1,0000	0,000	10,0000
Errors series 2	1,0000	0,000	25,0000
Errors series 3	5,0000	0,000	25,0000
Errors series 4	6,5000	1,000	25,0000
TowerTurns	17,0000	7,000000	49,0000
TowerTime	126,0000	7,000000	300,0000
Anxiety	42,0000	21,000	63,0000
Emotion Naming	8,0000	4,000	15,0000
Emotion Classification	7,0000	0,000	24,0000
Yes-No	4,5000	0,000	19,0000
Neuropsychological tasks	3,7500	0,000	6,0000

Table 02. Children performance in behavioral control tasks

The table shows the scores of behavior control (time in each of the series of the task of combining attributes, errors made in each series, the number of moves and time in the "Tower of Hanoi" task, level of anxiety, number of errors in naming and classification of emotions, number of errors in the "Yes-No" task, the scores in neuropsychological tests). Children with special needs were characterized of the sharp rise the time spending on series, when shifting from sorting by color to sorting by form and the number of errors in the recognition and classification of emotions, as well as in the inhibition task ("Yes-No").



## 6.3. ToM's tasks performance

Figure 02. Results of ToM's tasks performance (%) by children with special needs

Considering the development of certain aspects of understanding the mental world in children with special needs of 7-8 years, we can conclude that most children well understand the difference between the visual perspectives , understand first order false beliefs, well understand deception and "white lie", but cannot yet attribute the false belief to one character about the mental states of another character story ( 2nd order false belief) (the 1st and 2nd order false belief of  $\varphi$ = 3,221, p≤0, 01; 2nd order false belief and understanding of deception  $\varphi$ =4.673, p≤0.01; 2nd order false belief and understanding of "white lie"  $\varphi$ =5,161, p≤0, 01) (see fig. 02). Thus, children better understand the speaker's egoistic and altruistic intentions in situations of deception than the fact that another person may have false belief about the mental states of a person and, therefore, incorrectly predict his further behavior.

#### 6.4. The role of theory of mind and behavioral control in the school adaptation

Considering theory of mind as an indicator of psychological health and the success of school adaptation in students with special needs, differences were found at the level of the trend in groups of successful and unsuccessful in understanding the mental world (median criterion for the performance of tasks on theory of mind) in teachers' assessments of success school achievement (U = 20, p = 0.065). Thus, children who better understood the difference in visual perspective, could attribute to another opinion that was different from their own, including the opinion of the mental states of another person, also are children, whose assessment by their teachers as more successfully in school achievement. This data can also be confirmed by correlation between the overall score of theory of mind and the school achievement (r = 0.454, p = 0.05).

Most studies of the relationship of theory of mind, social competence and academic skills have been carried out with the participation of typical development children. However, their results showed that school achievement is closely related to theory of mind's the tasks performance (Imuta et al., 2016; Lecce et al., 2017; Lockl et al., 2017; Wellman, 2016). A study of the development of theory of mind in children with special needs demonstrated the relationship of theory of mind with the social skills of children, the success of peer's relation and children's linguistic abilities (Smogorzewska et al., 2018). Comparative studies of inclusive and segregation education for children with special needs also demonstrated reliable relationship between social competence (as estimated by parents and teachers) and the performance of the tasks of theory of mind (Borisova, 2019; Yukselen & Yaban, 2013).

Further, we investigated the relationship between the scores of behavior control and children's adaptation. The scores of general adaptation, behavioral adaptation and adaptation to interaction with adults (social competence) correlated with the behavioral control scores more closely than others. The correlations of adaptation and behavioral control (it was only cognitive control scores) - are presented in Table 03.

	General	Adult's	Children's	Academic	Problem
	school	relation		achievement	behavior
	adaptation		relation		
Task of	-,471 (,048)			-,515 (,028)	,526 (,025)
combining					
attributes series 1					
Task of		-,570 (,017)			
combining					
attributes series 2					
Task of	-,487 (,046)	-,489 (,046)			
combining					
attributes series 3					
Task of	-,524 (,025)	-,832 (,000)	-,562 (,015)		
combining					
attributes series 4					
Errors series 2					,599, (,011)
Errors series 3		-,522, (,031)			,574 (,016)
Errors series 4				-,539 (,021)	,463 (,053)

Table 03. Behaviora	l control and ada	ptation relations (	(p-value)
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Ability to switching and distribution of attention and accuracy of task performance is the key ability to the school adaptation (and in those aspects that assessed highly by teachers, so we can consider the behavioral control as an adaptation source). For behavioral adaptation, the ability to maintain concentration on the task (we can consider at as working memory in this case) is essential along with switching and distributing attention (i.e., for behavioral adaptation high level of some executive functions is significant (flexibility, working memory, attention distribution).

Thus, the ability to concentrate, switch and distribute an attention and the accuracy of the task performance is of high importance for the adaptation of children with special needs in school, not only to adapt to learning, but also for social adaptation (interactions with adults, the understanding and implication of the behavior rules in school).

A significance of attention for school performance, and for the presence / absence of conduct problems considered in many studies (Blair & Razza, 2007; Duncan et al., 2007; Magnuson et al., 2016; McClelland et al., 2013).

Surprisingly, school adaptation didn't connect with emotional control and control of actions, including the control of impulsivity, which play an essential role in the development of behavior control in typically developing preschool children (Vilenskaya, 2019). Perhaps it was because the teachers assessed the children's adaptation, they are more focused on school performance and academic achievements of children, and they look at adaptation in terms of learning. Moreover, for academic success attention is important in a large extent. However, a significant contribution of the "cool" (cognitive) executive function was also found in the work of Brock et al. (2009). "Cool" executive functions (similar to cognitive control and control of actions in our study) are associated with better academic performance and higher estimates of their behavior by teachers. At the same time, "hot" executive functions (which can be viewed as analogous to control impulsivity in our study) make a significantly smaller contribution to the performance and behavior of children in school, although they are associated with school engagement and, to a lesser extent, with academic performance (Kim et al., 2013). On the contrary, in the work of Chi et al (2018), a

contribution of "hot" executive functions to the adaptation of children to school was found in a sample of South Korean children. However, since the relationship found between "cool" and "hot" executive functions in typically developing children (Kouklari et al., 2017), the contribution of self-regulation's different components to school adjustment is not fully clarify.

# 7. Conclusion

The current study found that theory of mind and behavioral control were actually associated with the success of adaptation to school, academic success, social competence, understanding of the rules of behavior in school.

The children with special needs who better understood the difference in the visual perspective understood the false beliefs, could predict the behavior of other people had higher academic achievements according to teachers' assessments. At the same time, children who could better manage their attention, change their behavior, switching from one rule to another, remember the whole set of rules, were able to adapt both to the situation of school education in general and to interaction with adults better, and more successful in learning of school behavior rules.

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