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THE SPECIFIC OF FORECASTING IN ACTIVITIES OF CHILDREN WITH DEVELOPMENTAL DISORDER

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Abstract

The issue of forecasting capability is being actively studied in the humanities. However, the analysis of the studies devoted to this topic shows a deficit of common conceptions about forecasting capability of preschoolers with and without developmental disorders. There is a lack of scientific data on the specificity of forecasting capability in the life of a preschooler. The purpose of this research was to study the forecasting indicators in various forms of joint activity of children with speech, hearing, visual, motor and emotional disorders. The research involved 438 children aged 5-7 years with and without developmental disorders who attend preschool educational institutions in Russia. The methods we used included the "Guessing game methodology" (Peresleni) and surveillance of a child in organized and free activities (Samokhvalova's technique). Forecasting strategies turned out to be closely associated with activities of children with developmental disorders in regime moments, with free and organized activity in situations of "child-parent", "child-peer", "child-teacher" types of interactions. Children with sound forecasting strategies are more likely to comply with safety rules and requirements set by adults. Children with emotional disorders are not able to forecast further events and often choose irrational strategies in their forecasting. The data obtained during the course of the research can be used to adapt and accompany children with developmental disorders in educational institutions.

Keywords: Forecasting, activity, preschool age, developmental disorders.

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1. Introduction

The development of anticipation skills is considered as one of the key areas of the socialization process (Suddendorf, Nielsen, & von Gehlen, 2011). Intensive development of forecasting skills in older preschool age makes it an important resource for the positive socialization of a child (Regush, 1981). At a preschool age, children gradually learn to imagine future events and mentally simulate future situations. Self-awareness and understanding of one's own mental states and the states of other people that form at this age also contribute to the formation of future thinking skills (Suddendorf & Redshaw, 2013). It is important to take into account the specifics of forecasting as a special form of thinking about the future which is different from planning and self-control (Suddendorf et al., 2011). Modern research studies how preschoolers predict their physiological needs (Mahy, 2016; Suddendorf et al., 2011); use a different number of information sources to predict future situations (Reutera, Embersona, Rombergb, & Lew-Williamsa, 2018). It is emphasized that the ability to predict the future may differ from the ability to plan it (Atance & Jackson, 2009) and does not always depend on the children's ability to remember events (Suddendorf et al., 2011).

Empirical studies prove that children's ability to recall past events and their ability to predict future events appear at 3-5 years of age, and by 4-5 years of age children are quite capable of reporting events that occurred yesterday and will happen tomorrow (Busby & Suddendorf, 2005). According to Suddendorf and Redshaw (2013), by the age of 4, children acquire basic cognitive components necessary for mental construction of specific future events. Preschoolers begin to extrapolate negative experiences associated with similar situations in the past into future situations (Lagattuta, 2014), and the formation of links between the past, present and future ("mental time travel") is considered necessary for adaptive social functioning (Suddendorf & Redshaw, 2013).

The mechanisms of emotional anticipation of the result of some action by preschoolers are studied by Zhadaeva (2006), who argues that elements of an emotionally saturated situation, which turn into emotional and imaginative means of anticipation, begin to have a definite effect on the behavior of a preschooler in other situations. According to Elkonin (1989), the meaning of the development of the ability to emotionally anticipate the result lies in the fact that it lets children develop their self-regulation. The value of the development of the mechanism of emotional anticipation of the result lies in the fact that the subordination of motives based on a consciously accepted intention begins to arise precisely at a preschool age.

2. Problem Statement

Thus, the analysis of modern scientific sources suggests that, despite close attention to the issue of forecasting at a preschool age, there is a lack of common concepts concerning the forecasting capability of preschoolers with normal and impaired mental development, and there is no data on the specificity of forecasting in the activities of preschoolers.

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3. Research Questions

We have assumed that in children with disorders, the ability to predict in various forms of joint activity will be significantly reduced in comparion to their normotypic peers in free, organized activity in situations of “child-parent”, “child-peer”, “child-teacher” types of interaction.

4. Purpose of the Study

The purpose of this research was to study the forecasting indicators in various forms of joint activity of children with speech, hearing, visual, motor and emotional disorders.

5. Research Methods

The study involved 438 children of 5-7 years of age who attend educational institutions of the Republic of Tatarstan of the Russian Federation: 210 children with no developmental disorders; 139 children with severe speech disorders; 20 children with motor disorders; 30 children with visual disorders (strabismus, amblyopia, astigmatism); 20 children with hearing disorders (sensorineural hearing loss of III and IV degrees); 19 children with autism spectrum disorders. All children had intact intelligence. Parents gave their permission for working with children. Research activities were carried out in the morning on an individual basis. As a rule, researchers needed several meetings with each child. The research involved teachers, psychologists of educational institutions, visual and hearing impairment specialists.

The research used the “Guessing game methodology” (Peresleni & Podobed, 1982) and the method of surveillance of children in organized and free activities.

6. Findings

For processing the results of the study the SPSS 21 statistical program was used. Differences between the samples of children with developmental disorders and without developmental disorders were revealed using Student’s T-test with the significance level of $p < 0.001$.

We also used Pearson’s correlation coefficient for analyzing the relationship between forecasting and socialization indicators. The significance level of 0.01 was taken into account.

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6.1. Analysis of forecasting indicators and activity in preschoolers with developmental disorders (Table 1)

Table 01. Descriptive statistics on indicators of forecasting and activity in preschoolers with developmental disorders

Methodology Indicators	**Median value (M)**					
	Children without developmental disorders	Children with speech disorders	Children with hearing disorders	Children with visual disorders	Children with motor disorders	Children with autistic spectrum disorders
Forecasting						
Forecast formation rate	2.65	2.41	1.05	2.20	1.55	**.90**
Maturity of regulation	1.63	1.40	1.55	1.26	1.22	**.70**
Reproduction	2.19	**1.94**	2.50	2.06	**1.55**	**.90**
Strategies	3.63	**3.42**	4.45	3.46	**3.00**	**1.30**
Activity						
Regime moments. Child-Parent	67.40	61.87	68.50	57.03	**48.66**	**48.50**
Regime moments. Child-Adult	66.27	59.87	**60.70**	51.53	**44.44**	**52.70**
Regime moments. Child-Peer	65.25	57.30	62.00	47.80	**33.22**	44.20
Organized activity Child-Adult	66.49	**60.31**	**62.35**	53.00	**46.77**	52.00
Organized activity Child-Peer	64.91	**57.81**	61.50	48.53	**38.44**	44.40
Free activity Child-Adult	65.57	55.49	62.10	50.13	**37.22**	**51.00**
Free activity Child-Peer	65.72	56.75	62.70	51.90	**34.44**	**45.30**

Note: bold is used to mark significant statistical differences ($p < 0.001$) between samples of children with developmental disorders and samples of children without developmental disorders.

6.2. The specifics of forecasting in the activities of children with speech disorders

The “Guessing game methodology” proposed by Peresleni and Podobed (1982) made it possible to identify the features of forecasting activity of children. The indicators of forecasting activity in children with speech disorders are lower than in children without developmental disorders: “forecast formation rate” (Msd = 2.41; Md = 2.65); “Maturity of regulation” (Msd = 1.40; Md = 1.63), however, the differences are not statistically significant, i.e. children hold forecasts well enough in their memory and can compare them. We also noted the stability of their voluntary attention. Significant differences were revealed in “reproduction” (Msd = 1.94; Md = 2.19) (t = 3.53) and “strategies” (Msd = 3.42; Md = 3.63)

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(t = 2, 95) indicators. Preschoolers with speech disorders are less likely to choose rational forecasting strategies, not always do they successfully apply their experience in new situations.

We used the expert method to study children's actions in organized and free activities, regime moments in situations of their interaction with parents, teachers, and peers. Statistically significant differences were revealed in organized activities of children in "child-teacher" (t = 5.98) type of interaction, "child-peer" (t = 6.50) type of interaction in free activities.

Forecasting strategies are also associated with the activities of a child with speech pathologies in regime moments (when coming to kindergarten, undressing / dressing, at hygiene procedures, when eating) in "child-parent" (r = .44); "child-teacher" (r = .41); "child-peer" (r = .46) types of interaction; with children's activities during classes, organized team games in a "child-teacher" (r = .41) situation of interaction; "child – peer" (r = .48) interaction; as well as in the situation of absence of strict rules and strict standards of behaviour in "child – teacher" (r = .44); "child-peer" (r = .41) types of interaction. Children with sound forecasting strategies are more likely to comply with safety rules and requirements set by adults. Children with speech disorders experiencing difficulties in free communication with adults and peers more often demonstrated inability to predict situations of the future and used ineffective forms of forecasting.

6.3. The specifics of forecasting in the activities of children with hearing disorders

Indicators of forecasting activity in children with hearing disorders are lower than in children with no developmental disorders: "forecast formation rate" (Mhd = 1.05; Md = 2.65); "maturity of regulation" (Mhd = 1.55; Md = 1.63). However, the differences are not statistically significant, i.e. children hold forecasts well enough in their memory and can compare them. We also noted the stability of their voluntary attention. Such indicators as "reproduction" (Mhd = 2.50; Md = 2.18) and "strategies" (Mhd = 4.45; Md = 3.63) in preschoolers with hearing impairment are higher than in children without developmental disorders, which demonstrates the use of rational strategies and past experience in forecasting by children with hearing impairments.

Statistically significant differences were revealed in organized activities of children in "child-adult" (t = 1.96), "child-teacher" (t = 2.52) types of interaction in regime moments. Forecasting strategies are also associated with the activities of a child with hearing disorders in regime moments (when coming to kindergarten, undressing / dressing, at hygiene procedures, when eating) in a "child-peer" situation of interaction (r = .57); with children's activities during classes, organized collective games in a "child-teacher" (r = .63) situation of interaction.

6.4. The specifics of forecasting in the activities of children with visual disorders

The indicators of forecasting activity in children with visual disorders are lower than in children with no developmental disorders: "forecast formation rate" (Mvd = 2.20; Md = 2.65); "maturity of regulation" (Mvd = 1.26; Md = 1.63). However, the differences are not statistically significant, i.e. children hold forecasts well enough in their memory and can compare them. We also noted the stability of their voluntary attention.

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Such indicators as “reproduction” (Mvd = 2.06; Md = 2.18) and "strategies" (Mvd = 3.46; Md = 3.63) in preschoolers with visual disorders are also lower than in their peers, although no statistically significant differences between the samples were found.

The average values of children with visual impairments are lower than those of their normotypic peers in regime moments of “child–parent” (Mnz = 67.03; Mn = 67.39), “child-teacher” (Mvd = 51.53; Md = 66.27), “child-peer” (Mvd = 47.80; Md = 65.25) types of interaction. The average values of “child-teacher” (Mvd = 53.00; Md = 66.48), “child-peer” (Mvd = 48.53; Md = 64.91) indicators of interaction in organized activities are lower as well. The same situation may be observed when it comes to “child-teacher” (Mvd = 50.13; Md = 65.56), “child-peer” (Mvd = 51.90; Md = 65.71) indicators of interaction in free activity. Children with visual impairments are less successful in interacting with adults and peers in all types of activities.

We have revealed correlations between forecast formation rate and indicators reflecting the level of communicative development, manifested in interaction with parents, teachers and peers in regime moments (r = .42, r = .38, r = .43).

6.5. The specifics of forecasting in the activities of children with motor disorders

Indicators of forecasting activity in children with motor disorders are lower than in children with no developmental disorders: “forecast formation rate” (Mmd = 1.55; Md = 2.65); “maturity of regulation” (Mmd = 1.22; Md = 1.63). However, the differences are not statistically significant, i.e. children hold forecasts well enough in their memory and can compare them. We also noted the stability of their voluntary attention.

The average values of children with motor impairments are statistically lower than those of their normotypic peers in “child-parent” (Mmd = 48.66; Md = 67.39) (t = 6.31), “child-teacher” (Mmd = 44.44; Md = 66.27) (t = 6.83), “child-peer” (Mmd = 33.22; Md = 65.25) (t = 10.89) type of interaction in regime moments. The average values of “child-teacher” (Mmd = 37.22; Md = 65.56) (t = 7.43), “child-peer” (Mmd = 34.44; Md = 65.71) (t = 8.43) indicators of interaction in free activities are lower as well. Children with motor impairments have lower indicators of interaction with adults and peers in compare to their peers with no developmental disorders in all types of interaction.

Statistically significant differences were revealed in “reproduction” (Mmd = 1.55; Md = 2.18) (t = 2.98) and “strategy” (Mmd = 3.00; Md = 3.63) (t = 2.60) types of interaction. Preschoolers with motor disorders are less likely to choose rational forecasting strategies, not always do they successfully apply their experience in new situations.

6.6. The specifics of forecasting in the activities of children with emotional disorders

All indicators of forecasting activity in children with emotional disorders are statistically lower than in children with no developmental disorders, and these differences are statistically significant: “forecast formation rate” (Med = 0.90; Md = 2.65) (t = 8.41) ; “maturity of regulation” (Med = 0.70; Md = 1.63) (t = 4.20). Statistically significant differences were revealed in “reproduction” (Med = 0.90; Md = 2.18) (t = 6.34) and “strategies” (Med = 1.30; Md = 3.63) (t = 3.87) indicators. Preschoolers with emotional disorders are more likely to choose irrational or random strategies in forecasting, they almost

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do not use their experience in new situations and are unable to keep forecasts in their memory and compare them.

The average values of children with emotional disorders are statistically lower than those of their normotypic peers in “child-parent” (Med = 48.50; Md = 67.39) (t = 6.31), “child-teacher” (Med = 52.70; Md = 66.27) (t = 6.83), “child-peer” (Med = 44.20; Md = 65.25) types of interaction in regime moments. The average values of “child-teacher” (Meng = 52.00; Mn = 66.48) (t = 6.28), “child-peer” (Med = 44.00; Md = 64.91) (t = 8.02) indicators in organized activities are lower as well. The same thing can be said about “child-teacher” (Med = 51.00; Md = 65.56) (t = 3.98), “child-peer” (Med = 45.71; Md = 65.71) (t = 5.87) interaction indicators in a free activity. Thus, we can conclude that in all types of activities of children with emotional disorders, their interaction with adults and peers is impaired. The “reproduction” indicator is closely associated with the level of communicative development in interaction with peers in regime moments (r = .78). It indicates that if a child conducts a dialogue, interacts with peers during walks, washing, than he is more capable of remembering and reproducing previously predicted thoughts based on past communication experience (r = .83).

7. Conclusion

The study of the children’s actions in organized and free activities, regime moments in situations of interaction of children with parents, teachers, peers helped to reveal difficulties in communicating with peers in unregulated, unorganized activities. The lowest rates of indicators in all types of activities were found in children with emotional disorders whose interaction with adults and peers is clearly impaired. Similar results among children of primary school age were published in the studies by Rozental, Akhmetzyanova, and Artemyeva (2018) and Guralnick (2010): children with visual disorders showed playful behaviour which had mostly individually-searchful nature, and such children did not to strive to play team games.

The research revealed the specificity of forecasting in preschoolers with developmental disorders. Preschoolers with speech and motor disorders are less likely to choose rational forecasting strategies in compare to their normotypic peers, not always do they successfully apply their experience in new situations. Akhmetzyanova and Artemyeva (Akhmetzyanova, 2004; Akhmetzyanova & Artemyeva, 2019) found that in the prevailing part of children with general underdevelopment of speech, adequate forecasts of events are formed at a slower pace, with a larger number of “distraction errors”, and the use of irrational strategies. The values of such indicators as “reproduction” and “strategies” in preschoolers with hearing disorders turned out to be higher than in children without developmental disorders, which demonstrates the use of rational strategies and past experience by children with hearing disorders in their forecasting activity. Preschoolers with emotional disorders often chose irrational or random strategies in forecasting. The scientific data presented by various authors on the features of forecasting often contradict each other. For example, Terrett et al. (2013) note that children and adults with autism spectrum disorders are characterized by a deficit in cognitive aspects of thinking about the future. However, Angus, de Rosnay, Lunenburg, Terwogt, & Sander (2014) did not find any significant differences in characteristics of the expected behaviour of another person between intellectually sound children with ASD and children with normal development. Children with autism spectrum disorders were second only to the ability to

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predict their own responses to the questions from adults. According to Wing and Gould (1979), children with various degrees of severity of key signs of autism experience difficulties in using speech for communication; in expressing their emotions and understanding the emotions of other people. Our study also allows us to speak of the difficulties in understanding the emotions of other people and the use of irrational forecasting strategies by children with ASD who have intact intelligence.

Forecasting strategies turned out to be closely associated with activities of children with developmental disorders in regime moments, with free and organized activity in situations of "child-teacher", "child-peer" "child-parent" types of interaction. Children with rational forecasting strategies are more likely to comply with safety rules and requirements set by adults. Using the expert method, we could study the actions of children in organized and free activities, regime moments in situations of interaction of children with parents, teachers, and peers. Children with developmental disorders experience significant difficulties in organizing free and organized activities with their peers; their communication with people who are not family members or teachers is impaired. We noted that such children prefer to avoid contact and that they are characterized by a high level of anxiety.

The research revealed forecasting features of preschoolers with developmental disorders. In fact, children with emotional disorders are not able to forecast further events, most often choosing irrational or random strategies in their forecasting activity and hardly using their own life experience in new situations. They are unable to keep forecasts in their memory and compare them.

The empirical study confirmed the existence of close correlations between forecasting indicators: forecast formation rate, forecasting maturity, the success of perception and forecasting strategies with indicators of a child's communicative interaction in a context of free, organized activity and in regime moments in interaction with adults and peers. We have revealed that the success of forecasts largely depends on the strategies that children choose in the process of activity.

The research allows us to suggest the need for special classes aimed at developing the ability of children to anticipate future situations in various types of joint activities.

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