ARTÍCULOS

Correlation between forecasting and successful socialization of children with development disorders

Correlación entre previsión y socialización exitosa de niños con trastornos del desarrollo

A.I. AKHMETZYANOVA
ORCID: http://orcid.org/0000-0003-3626-6065
anna.ahmetzyanova@kpfu.ru
Kazan Federal University, Kazan, Russian Federation

T.V. ARTEMYEVA
ORCID: http://orcid.org/0000-0002-6029-2645
tatyana.artemeva@kpfu.ru
Kazan Federal University, Kazan, Russian Federation

ABSTRACT

The purpose of the research was to study the indicators of children's socialization and their dependence on the ability to predict children with speech, hearing, vision, motor and emotional disorders. The research involved 438 children of 5-7 years old with and without developmental disorders who attend preschool institutions in Russia. The empirical study confirmed the existence of close correlations between forecasting indicators and methodological indicators that reflect compliance of children's behavior with regulatory rules and children's communicative interaction in free and organized activity. The research data can be used to adapt and support children with developmental disorders in educational institutions.

Keywords: Developmental disorders, forecasting, preschool age, socialization.

RESUMEN

El propósito de la investigación fue estudiar los indicadores de socialización de los niños y su dependencia de la capacidad de predecir en niños con trastornos del habla, audición, visión, motores y emocionales. La investigación involucró a 438 niños de 5-7 años con y sin trastornos del desarrollo que asisten a instituciones preescolares en Rusia. El estudio empírico confirmó la existencia de correlaciones cercanas entre los indicadores de pronóstico y los indicadores metodológicos que reflejan el cumplimiento del comportamiento de los niños con las normas reguladoras y la interacción comunicativa de los niños en la actividad libre y organizada.

Palabras clave: Edad preescolar, previsión, socialización, trastornos del desarrollo.

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1. INTRODUCTION

Considering the preschool age, we can highlight such aspects of socialization as: mastering the rules by a preschooler; formation of a child's personality in the social space of relations with other people; interaction of child and culture; the role of adults in transfer of cultural norms; development of cultural congruence in a preschooler (Bayanova & Mustafin: 2016, pp. 357-364); awareness of rules and understanding of their moral meaning, awareness of their moral value; self-regulation of actions with a focus on moral rules and emotional state of peers in 5-6 year old children. Social competence of children depends on several factors, including social opportunities, contexts in which social interactions develop, as well as characteristics of peers, family, and culture (Annía, Villalobos, Romero, Ramírez & Ramos: 2018; Akhmetzyanova & Artemyeva: 2019).

A significant role in our research is given to adults who – in the process of interaction with preschoolers – contribute to the socialization of children and transfer of rules that exist in society. Mikas (Mikas: 2012, pp. 207-214) notes that the help of teachers in the socialization of children is primarily associated with the development of social competence. Pearl (Pearl: 2014, pp. 177-188) found a correlation between emotionally oriented reactions of parents (mothers) and the development of children's social competence. Inability to regulate emotions is one of the most significant factors affecting children's behavior, aggression, and anxiety. Trevisan has revealed that the ability to recognize a person's emotional state is an important social-cognitive skill associated with social behavior and other characteristics of a person's cognitive capabilities (Trevisan & Birmingham: 2016; Villallobos & Ganga, 2016; Villalobos & Ganga, 2018; Villalobos, Guerrero & Romero, 2019). Relationships with peers act as an important area of preschoolers' socialization. In the process of socialization, peers transfer formal and informal social, emotional and cultural rules and norms that differ from the requirements of their parents (Ramírez, Lay, Avendaño y Herrera: 2018; Rincón, Sukier, Contreras y Ramírez: 2019; Akhmetzyanova & Artemyeva: 2019).

The analysis of studies devoted to socialization issues shows the lack of a single understanding of mechanisms, conditions, and factors for the development of positive socialization in dysontogenesis. According to Denisova (Denisova: 2012, pp. 97-101), successful socialization of modern preschoolers is hindered by the lack of free communication. Serkin (Serkin: 2018, pp. 317-319; Martins et al.: 2019) notes that preschoolers with speech disorders experience difficulties in carrying out collective activities. She also emphasizes their emotional instability. Children with autism spectrum disorders (ASD) are characterized by a significant deterioration in social interaction, which often leads to a lack of gaming and social skills. Studies show that children with visual disorders demonstrate playful behavior that has predominantly individually-search nature, which means they do not try to get involved in team games. Recognition of the emotional states of peers and adults by children with developmental disorders is difficult. Such kids find it hard to control their emotional responses and they show lower sensitivity to emotional responses of other people (Krupa, 2016, pp. 137-147) which significantly complicates socialization and successful adaptation of this category of children.

The development of the ability to anticipate future events is considered one of the key areas of the socialization process. Intensive development of forecasting skills in older preschool age makes it an important resource for positive socialization of a child. At preschool age, children gradually acquire the ability to imagine future events and mentally simulate future situations. Self-awareness and understanding of one's mental states and the states of other people who are being formed at this age also contribute to the formation of future thinking skills. It is important to take into account the specifics of forecasting as a special form of future thinking, which is different from planning and self-control.

Modern research study the ways preschoolers predict their physiological needs (Mahy: 2016, pp. 325-338.) and use a different number of information sources to predict future situations (Reuter et al.: 2018, pp. 215-219; Maragheh et al.: 2019, pp. 6-12). It is emphasized that the ability to predict the future may differ from the ability to plan it and does not always depend on the ability of children to remember things and events. According to Suddendorf (Suddendorf & Redshaw: 2013, pp. 135-153; Nalbandi & Zonoozi: 2019), children

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acquire basic cognitive components necessary for mental construction of specific future events by the age of four. Preschoolers begin to extrapolate negative experiences associated with similar situations in the past into future situations earlier (Lagattuta: 2014, pp. 90-95; Revisan et al.: 2020), and the formation of links between the past, present, and future ("mental time travel") is considered necessary for adaptive social functioning (Suddendorf & Redshaw: 2013, pp. 135-153; Ahmadi & Movahed: 2019, pp. 1-10). Mechanisms of emotional anticipation of the result of some action by preschoolers were studied by E.L. Zhadaeva (Zhadaeva: 2006, pp. 36-44). She suggests that the elements of emotionally saturated situations start to act as emotionally figurative means of anticipation and begin to have a certain effect on the behavior of a preschooler in other situations.

Thus, the analysis of modern studies suggests that – despite close attention to the issue of forecasting in a preschool-age – there is a lack of common concepts about forecasting capability of preschoolers with and without mental development disorders; there is no data on the correlation between forecasting skills and preschoolers' socialization progress.

2. MATERIAL AND METHODS

2.1 Sample

The research involved 438 children aged 5-7 years who attend educational institutions of the Republic of Tatarstan in the Russian Federation: 210 children without 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 levels); 19 children with autism spectrum disorders. All children had intact intelligence. Researchers got parental permission to work 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.

2.2 Research methods

The following methods and techniques were used in the research:
- Expert assessment of children's behavior using the method developed by A.M. Kazmin, N.A. Konovko, O.G. Salnikova, E.K. Tupitsina, E.V. Fedina "The scale of emotional distress and atypical behavior" (Kazmin et al.: 2014).
- The method of surveillance of children in organized and free activities (Matsuda et al.: 2017, p. 1029).
- "Emotional faces" technique developed by N.Y. Semago (Semago: 2005).
- The set of methods for determining the level of communicative capabilities of preschoolers (Veraksa: 2010).
- The method of "Determining the cultural congruence of a younger schoolchild" (Bayanova & Mustafin: 2016: pp. 357-364).
- The "Guessing game methodology" (Semago: 2005).

2.3 Research hypothesis

We assumed that indicators of forecasting capability and socialization progress in various forms of joint activity of children with disorders would be significantly lower in comparison to their normotypic peers. The success of socialization may be associated with the strategies that children choose for forecasting future situations.

2.4 Purpose of the research

The purpose of the research was to identify the correlation between forecasting capability and indicators of socialization of preschoolers with speech, hearing, visual, motor and emotional disorders.

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2.5 Research objectives
    a) To study the indicators of socialization of preschoolers living with disabilities: to evaluate their understanding of social norms and values and the specifics of communication and interaction of such children with peers and adults; to identify the specifics of their behavior.
    b) To study the features of forecast skills of preschoolers with developmental disorders.
    c) To identify the correlation between forecasting and socialization in preschoolers with sensory, speech, motor and emotional disorders.

3. RESULTS

We used SPSS 21 statistical program for processing the results of the research. 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 used Pearson's correlation coefficient for analyzing the relationship between indicators of forecasting and socialization. The significance level of 0.01 was taken into account.

Analysis of forecasting indicators and activity in preschoolers with developmental disorders

Methods/ techniques	Indicator number	Indicator	Median (M)					
			No disorders	Speech disorders	Hearing disorders	Visual disorders	Motor disorders	Autism spectrum disorders
Adherence to the rules of a normative situation	1	Obedience	44.54	39.81	**35.95**	**35.76**	**29.78**	**29.60**
	2	Safety	56.31	**50.91**	**46.60**	**51.56**	**39.33**	**37.80**
	3	Hygiene	39.11	**34.34**	36.40	**26.96**	34.11	29.40
	4	Self-control	33.30	29.76	**30.00**	**23.70**	28.78	**21.80**
Communicative skills	5	Understanding of tasks	2.71	2.52	1.90	2.33	2.44	.80
	6	Understanding of states	2.70	2.48	2.50	2.63	3.00	1.20
	7	Attitude towards adults	2.48	**2.15**	1.90	**2.13**	2.11	1.00
	8	Attitude towards peers	2.40	2.12	**2.00**	2.26	**1.88**	1.20
Samokhvalova's questionnaire	9	Regime moments. child-parent	67.40	61.87	68.50	57.03	**48.66**	**48.50**
	10	Regime moments. Child-adult	66.27	59.87	**60.70**	51.53	**44.44**	**52.70**
	11	Regime moments. Child-peers	65.25	57.30	62.00	47.80	**33.22**	44.20
	12	Organized activity. Child-adult	66.49	**60.31**	**62.35**	53.00	**46.77**	52.00
	13	Organized activity. Child-peers	64.91	**57.81**	61.50	48.53	**38.44**	44.40

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	14	Organized activity. Child-adults	65.57	55.49	62.10	50.13	**37.22**	**51.00**
	15	Free activity. Child-peers	65.72	56.75	62.70	51.90	**34.44**	**45.30**
Atypical behavior	16	Insularity	1.75	4.12	3.15	4.40	**6.11**	**8.90**
	17	Anxiety	2.44	3.96	2.85	4.46	**5.22**	3.60
	18	Depression	1.02	1.84	2.90	2.46	**4.88**	**5.50**
	19	Maladaptation	.63	1.08	1.20	.73	**3.66**	**5.10**
	20	Hyperactivity	2.69	3.57	3.30	4.13	**7.44**	**11.20**
Forecasting	21	Forecast formation rate	2.65	2.41	1.05	2.20	1.55	**.90**
	22	Maturity of regulation	1.63	1.40	1.55	1.26	1.22	**.70**
	23	Reproduction	2.19	**1.94**	2.50	2.06	**1.55**	**.90**
	24	Strategies	3.63	**3.42**	4.45	3.46	**3.00**	**1.30**
Semago's technique	25	Emotions	6.86	**6.07**	5.40	**5.76**	**5.33**	**2.50**

Table 1. Descriptive statistics on indicators of forecasting and activity in preschoolers with developmental disorders

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

3.1 Correlation between forecasting capability and socialization of preschoolers with developmental disorders

3.1.1 Children with speech disorders

Correlation analysis revealed inverse relationships between forecasting strategies and "insularity" indicator according to the "Scale of emotional distress and atypical behavior" methodology (r = - .22), which may indicate that the inability or unwillingness of a child to interact with other people makes it difficult for them to formulate adequate forecasts. Forecasting strategies are also associated with activities of children with speech pathologies in regime moments, with child's activities in a classroom, in organized collective games. Children using sound forecasting strategies are more likely to adhere to safety rules and requirements set by adults.

We have revealed connections between forecasting strategies and such factors of cultural congruence as "obedience" (r = .32) and "safety" (r = .29). Children who can control their actions aimed at compliance with certain rules are more likely to use rational forecasting strategies.

3.1.3 Children with hearing disorders

Forecasting strategies are associated with activities of children with hearing disorders in regime moments in a "child - peer" situation of interaction (r = .57); with child's activities in a classroom, in organized collective games in a "child - teacher" (r = .63) type of interaction. We have revealed a correlation between the "forecast formation rate" indicator, which reflects the effectiveness of the formation of an adequate forecast with the "self-control" indicator (r = .64). The "maturity of regulation" indicator, reflecting the stability of voluntary attention, has correlations with "obedience" (r = .62). We have also revealed the correlation of this indicator

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with indicators reflecting the level of communicative development manifested in interaction with parents, teachers, and peers in regime moments (r = .70, r = .46, r = .54). We have found correlations between forecast formation rate and indicators reflecting the level of communicative development manifested in interaction with teachers and peers in organized activities (r = .56, r = .58) and free activity of children (r = .53, r = .58). This indicator has also shown an inverse correlation with indicators of atypical behavior: "anxiety" (r = -.563) and "hyperactivity" (r = -.60). The "reproduction" indicator which reflects the functioning of long-term memory has correlations with the level of communicative development in interaction with peers and teachers in regime moments (r = .57, r = .59), the indicator showed the inverse correlation with atypical behavior indicators: "depression" (r = -.54).

3.1.4 Children with visual disorders

We have found 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). The "maturity of regulation" indicator which reflects the stability of voluntary attention has correlations with obedience (r = .53); hygiene (r =. 63), self-control (r = .50) and indicators reflecting the level of communicative development manifested in interaction with teachers and peers in regime moments (r = .52, r = .59), in organized activities (r = .51, r = .56), in free activity (r = .49, r = .46): children can regulate their forecasting in these situations and this positively affects the development of their communication skills. The "reproduction" indicator is associated with long-term memory and has correlations with the level of communicative development in interaction with peers in regime moments (r = .46). The indicator is also associated with child's obedience (r = .45), hygiene (r = .42) and indicators of the level of communicative development in interaction with parents, teachers in organized activities (r = .46) and free activity (r = .45). We have found a correlation between the "forecast formation rate" indicator with the "hygiene" indicator (r = .41), and with an understanding of tasks set by adults in various situations of interaction (r = .52).

3.1.4 Children with motor disorders

We have revealed a close correlation between the "forecast formation rate" indicator, which reflects the effectiveness of the formation of an adequate forecast, a child's ability to keep forecasts in memory, compare them and make conclusions with the "obedience" indicator (r = .86). The inability of a child with motor disorder to control his actions aimed at meeting certain requirements and expectations of adults affects a child's ability to formulate adequate forecasts, keep them in memory, compare them and make conclusions.

3.1.5 Children with emotional disorders

We have found correlation between the "forecast formation rate" indicator with "hygiene" (r = .70) and "self-control" (r = .65) indicators. The "maturity of regulation" indicator has correlations with "obedience" (r = .81). However, the indicators of "obedience" and " maturity of regulation" of children with emotional disorders are very low. A negative correlation was found between this forecasting indicator and the "insulary" indicator (r = -80), as well as with an understanding of emotions (r = 88.). The inability of children to interact with other people, to differentiate their emotional states affects their forecasting skills. The "reproduction" indicator has a close correlation with the level of communicative development in interaction with peers in regime moments (r = .78). The indicator is associated with the obedience of a child (r = .77), with indicators of the level of communicative development in interaction with teachers in organized activities (r = .81).

The empirical research showed that the values of all indicators of the methods were higher in children with normotypic development except indicators concerning atypical behavior technique. Almost all children with developmental disorders showed average values on such scales as insulary, anxiety, depression, maladaptation, hyperactivity that were higher than in their normotipic peers. Similar results for primary school children were shown by the studies conducted by Rozental (Rozental et al.: 2018, pp. 124-131). The empirical

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research found that in children with no developmental disorders, indicators for all factors of the methodology reflecting the level of cultural congruency, compliance with social norms and rules are significantly higher than in their peers with speech, hearing, vision, motor and emotional disorders. Children with normal development showed the highest results in the "obedience" indicator, which reflects the congruence of their behavior with expectations from adults regarding typical rules of interaction in a normative situation.

Preschoolers with hearing disorders have difficulty in controlling their behavior in a normative situation. Children with hearing disorders have significantly low rates in almost all indicators of the "Compliance of a preschooler with the rules of the normative situation" technique. Children with autism spectrum disorders not always clearly understand and avoid dangerous situations. Children with autism spectrum disorders, severe speech disorders, and motor disorders are characterized by significantly reduced orientation towards interaction with adults and compliance with the rules set by them. Children with severe speech disorders not always perceive adult prohibitions as a source of their safety which, in turn, leads to impaired behavior.

Communicative skills of children with hearing disorders about peers are developed significantly worse in comparison to their normotypic peers. The study of children's behavior in organized and free activities, in regime moments in situations of the interaction of children with parents, teachers, and peers helped to reveal difficulties in communication with peers in unregulated, unorganized activity. The behavior of children does not always meet the expectations of adults, making it difficult for them to adapt to new social conditions.

Our study revealed that children with developmental disorders experience difficulties in social interaction, their behavior does not always meet the expectations of adults, and they often violate the norms and rules of interaction in a situation of interaction with peers, which affects their socialization. Also, not in all situations, children with visual disorders preserve self-control; they cannot always comply with the rules of social interaction and control their actions. The lowest values of indicators in all types of activities were noted in children with emotional disorders who have impaired interaction with adults and peers as well as poor skills of understanding the states and emotions of people around them. The study led by Akhmetzyanova A.I (Akhmetzyanova & Artemyeva: 2019) came to similar conclusions. Studies by R. Brewer (Brewer et al.: 2016, pp. 262-271) also prove that children with autism spectrum disorder have difficulty not only in recognizing other people's emotions but in expressing their own emotions as well.

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 than their normotypic peers, not always do they successfully apply their experience in new situations. A.I. Akhmetzyanova 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 (Akhmetzyanova & Artemyeva: 2019). 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 – it demonstrates the use of rational strategies and 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.

Angus (Angus et al.: 2015, pp. 604-612) did not find any significant differences in characteristics of the expected behavior of another person between intellectually sound children with ASD and children with normal development. Children with autism spectrum disorders were second only in their ability to predict their responses to the questions from adults.

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.

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4. CONCLUSIONS

Children of all nosological groups have difficulties with social adaptation, obtaining social experience and mastering the rules in a normative situation. Limited opportunities for gathering information from the outside world make it difficult to develop a means of communication with adults and peers. Especially high rates for maladaptive behavior were shown by children with motor and emotional disorders; their average values in almost all scales are significantly different from those of children with normotypic development. Children experience anxiety and depression. We noted maladaptiveness and insularity of children in communication and interaction with adults and peers. In all groups of examined children with developmental disorders, the "safety" indicators are significantly lower than in children with no developmental disorders.

Using the expert method, we could study the actions of children in organized and free activities, regime moments in situations of the 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 their family members or teachers is impaired. We noted that such children prefer to avoid contacts and that they are characterized by a high level of anxiety.

The research revealed features of the forecasting activity of preschoolers with developmental disorders. Children with emotional disorders are unable to forecast further events; they often choose irrational or random strategies in their forecasting activity and hardly use 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 the context of free, organized activity and in regime moments in interaction with adults and peers. We found a close correlation between forecasting and personal and behavioral characteristics of children's behavior. It was revealed that the success of forecasting largely depends on the strategies that children choose in the process of their cognitive activity. This research confirmed the idea that self-control skills of children with developmental disorders in social interaction are noticeably worse than those of their norm typically developing peers.

The research allows us to suggest the need for special classes aimed at developing successful social behavior and abilities to anticipate future situations in children with developmental disorders.

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BIODATA

A.I. AKHMETZYANOVA: Akhmetzyanova Anna Ivanovna has a Ph.D. currently working as an Associate Professor and a Deputy Director for Research at the Institute of Psychology and Education. Is an associate professor, Deputy Director of Research Institute of Psychology and Education at Federal University, Kazan. Her research interests lie in the areas like Psychological mechanisms of anticipation, Innovative technologies of speech therapy and Psycho-pedagogy.

T.V. ARTEMYEVA: Tatiana Vasilyevna Artemyeva received higher education in 1981 at philosophy at Herzen State Pedagogical University of Russia, Saint Petersburg, Russian Federation. Has a Ph.D. currently working as an Associate Professor of Theory and History of Culture at philosophy at Herzen State Pedagogical University of Russia, Saint Petersburg, from 2004-01-10 to present.