

IFTE 2018
4th International Forum on Teacher Education

**ABILITY TO PREDICT AUTISM: ITS THERAPEUTIC
POTENTIAL FOR SOCIAL ADAPTATION**

I. V. Krotova (a)*, Tatiana Vasilyevna Artemyeva (b).

*Corresponding author

(a) Kazan Federal University, Kazan, Russia, Inna.Balymova@kpfu.ru, 89179249248

Abstract

Outstanding researches on the questions of autism in 2017 focused on the genetics (chromosome mutations), neurophysiology and brain activity. These directions are valid in solving problems of early diagnosis (from 0 to 1 year) of autism spectrum disorders. However, the proposed paradigm determines the causes of autism which are centralized in their origin and neurobiological in their nature. The studies suggest how to deal with autism. At the same time, the second type of researches are associated with behavioral therapy and the authors are looking for an active component that can enhance the effectiveness of pedagogical influence with the support and adaptation of people with autism, they suggest how it is right and possible to live with autism. Thus, in the context of formulating the problem of our research, we propose to consider a psychological-correctional path in the socialization of children with autism, since psychology has a unique integrative property in combining neurophysiology and pedagogical methods of therapy. Our scientific position is considered with a movement towards understanding the cause and effect of processes in autism behavioral therapy and the disclosure of the therapeutic potential of such an ability as prediction, the psychological content of which should confirm the knowledge and principles of social adaptation mechanisms in working with children with disorders of autism spectrum (DAS). The aim of our study is to reveal the presented hypothesis and the therapeutic role of the socio-adaptive functions of prognostic ability for children with autism.

© 2018 Published by Future Academy www.FutureAcademy.org.UK

Keywords: Children with autism, social adaptation, behavioral therapy, prediction, prognostic ability.



1. Introduction

Autism, or autism spectrum disorders (ASD), is evinced primarily in differences in three spheres: social interaction, communication and behavior (originality, limitations and stereotyped interests and activities). Autistic spectrum disorders include children's autism, atypical autism, Asperger's syndrome, organic autism, and autistic disorder (Lebedinskaya, & Nikolskaya, 1987). All these terms describe different manifestations of the same condition. Autism is often combined with other disorders. Majority of people with autism have normal level of intelligence, quite often people with autism have amazing abilities in the field of visual or musical perception, memory, mathematics and other sciences. People with autism also tend to live in their own world; and on the contrary, a lot of them are very interested in communicating with others, they are able to establish deep emotional ties with important people, but they do not have the skills to communicate in the same way as their peers do. Everyone with autism is unique in his autism manifestations, and at times it is difficult to understand at first sight what unites people with autism spectrum disorder. Some of them do not begin to talk at all and communicate using alternative means of communication (gestures, exchange cards or written text). In adulthood, they may require a lot of support and care, they cannot live on their own. Other people with autism can have quite developed speech and other social interaction skills, they can attend school, enter institutes of high education and they can work. They need support in order to live, fully realizing their capabilities, to cope with difficult social tasks. They need recognition and acceptance of their specific features as much as normal people do.

The big problem is that the symptoms of autism are becoming apparent closer to two or three years. At this age, as a rule, it is possible to diagnose autism. When the child becomes older, most often the symptoms of autism begin to disappear, or their manifestation becomes weaker, but in most cases they remain noticeable. In past years autism was considered to be a rare disorder, now it is obvious that this is not true. Nowadays specialists have learned much better to identify autism, so the diagnosis began to be made more often than before. But, perhaps, it's not just a matter of diagnosis, and autism has really started to become more typical. Scientists are trying to establish whether there is a real increase in the incidence of autism, and if there is, what the reasons for the growth of this disease worldwide are (Aarons, & Gittens, 1995).

Autism can occur due to various complex factors. The genetic factors play a very important role: differences at the genes level and molecules that store information about the way the human body should be formed and developed. Some of the genetic factors that cause autism are known and can be identified through analysis; these are primarily spontaneous changes in genetic material, mutations. These changes may be sufficient to induce autism. More often autism arises as a result of interaction of genetic factors and factors of environment where a child develops.

The basic autism disorders include several well-studied features:

- Differences in social interaction are the most important symptoms of autism. Often a small child with autism behaves as if he is 'on his wave', he may not show interest in other children's games and may even stubbornly refuse to participate in group games, it can be difficult to make him interested in something that the adult offers him, he does not repeat actions, movements and sounds after adults.

- Communication disorders are also a main autism symptom. Many children with autism start talking much later and may not use gestures. Instead, they use the hands of other people; bring adults to those

subjects with which they want the adults to do something. Other children may start talking and remembering many words early but do not use them in communication.

- Differences in behavior make the third group of mandatory symptoms for the diagnosis of ASD. A lot of children with autism play toys in an unusual way (for example, line up or scatter them), can often perform repetitive actions, be interested in unusual objects, move strangely, for example, swinging their arms, swinging on the spot or running around in circles. The symptoms of this group are very diverse.

2. Problem Statement

Treatment of autism is a process that requires an individual approach to each child depending on the severity of the symptoms, any autism-related disorders. Some children with autism need very intensive help in order to acquire the basic skills of social behavior, learn to speak (Lebedinskaya, & Nikolskaya, 1989; Morozov, & Morozova, 1997; Nikolskaya, Baenskaya, & Libling, 1997). Many children, at the same time, can learn complex skills independently and need more support with taking into account their perceptions. In some situations, specialists can prescribe remedies that are aimed at reducing the severity of behavioral problems, for example, hyperactivity or irritability; drugs that affect sleep, gastrointestinal function, and neurological disorders that occur in autistic spectrum disorders can also be used (Lebedinskii, & Nikolskaya, 1990). However, there are still no drugs that directly affect the symptoms of autism. The most effective method of treating autistic disorders is behavioral therapy, i.e. a process of systematic and consistent learning with encouraging the desired behavior. If diagnosis has been made early and therapy has been started in time, such programs, based on behavioral therapy, help the child to become more independent, capable of socially acceptable and age-appropriate behavior, significantly improve the prognosis for their development and socialization (Vedenina, 1997).

Nowadays, there are a huge number of techniques for autism treatment and almost every month there is something new appearing. The greatest role is given to applied analysis of behavior and behavioral techniques and it is necessary to start with them (Volkmar, & Vaizner, 2014; Delani, 2016; Barbera, 2017). It should be noted that parents and educators need to take a step back and stop thinking about autism in general, because the goal is not the autism. The goal is a unique child, his problems and difficulties, his important skills and those that he lacks. Some children with autism do not use speech at all and then the therapy should start with working on communication skills, over oral speech. There are behavioral techniques that are aimed specifically at solving these problems. Such methods are not suitable for a person with a fluent speech; the goals for him can be more complex, for example, the development of subtle social skills. Thus, it should be clearly understood that every child with autism and every adult with autism has own unique needs.

Over the past few years, several breakthroughs have been achieved in the treatment of autism. The greatest achievement is a large number of different methods supported by scientific evidence. Today there are a lot of studies that support both behavioral methods and the use of drugs in case of symptoms that can greatly complicate life in autism. Another achievement that is enriching this area right now is the data of genetic studies. And although these data have not yet become the basis for treatment methods, but such developments are already under way, and now thanks to genetic research, it is possible to determine the most promising drugs.

But if we talk about methods based on applied behavior analysis, it is very important to understand the main components of these methods, their positive effect in the course of complex behavioral intervention. The scientists should know whether this component can be selected and whether the effectiveness of behavioral therapy in developing social information understanding skills can be enhanced.

Such an active component in behavioral therapy can be searched by closer examination of the features of social adaptation of children with autism. Asynchrony (a significant unevenness in their development) gives specificity in the development of autistic people in childhood. Firstly, often it is a combination of good intellectual abilities with total helplessness in everyday life, extreme dependence on mothers in elementary household activities. Secondly, this is dissociation between a completely natural need for communication, expansion of contacts and low opportunities in interpersonal communication. The development of contacts is hampered by concentration on their stereotypical interests, inability to listen to the interlocutor, to keep a spatial and psychological distance in communication, inflexibility. Finally, one more aspect of this unevenness is associated with the significantly increasing demands of society (that are educators, peers, and just strangers around) to a child (in particular, the ability to behave appropriately in every respect, to monitor oneself and control oneself, to have certain ideas and good household skills). In general, as a rule, the adaptive capabilities of an autistic child in the face of these increased demands remain low.

These contradictions are often felt by autistic children themselves; as a result there is a growing awareness of one's own peculiarity, of distinguishing oneself from peers. Unfortunately, such awareness often leads to increased uncertainty, low self-esteem. In order to overcome that trainings with an autistic child should be saturated with positive emotions, support without forcing the learning process and dosing difficulty of tasks. This is an important condition; otherwise the training in social and domestic skills risks becoming an additional psychological trauma for an autistic adolescent. Mastering some new, difficult skills a child needs to be aware of own, independent life, separated from the lives of relatives and friends.

Thus, regardless of the severity of autism, learning anything should become psychotherapy for him at the same time. In other words, learning should work to increase his confidence and self-esteem, to build the sense of self-achievement that is so necessary at this age. Thus, an adult faces an uneasy task of capturing an autistic teenager with a belief in the necessity of mastering various household affairs. The work on the formation of social skills should be a great emotional support for an autistic child, a positive charge, increasing his confidence. In other words, the combination of an emotional charge with rational discussions will strengthen the child's motivation, his desire to do things demanding a truly significant payoff from a child.

3. Research Questions

What is the psychotherapeutic resource in the social adaptation of children with ASD? A clear definition of a possible potential effective component, such as the predictive ability is singled out by Akhmetzyanova (2017), Akhmetzyanova, & Artemyeva (2016), Akhmetzyanova, & Kurbanova (2017). The processes of forecasting (anticipation, foresight, future prognoses) are considered by the researchers in the number of psychological phenomena that are significant for socialization processes. The ability to predict is an important condition for successful socialization in different age periods (Mendelevich, 2005;

Andronov, 2015; Akhmetzyanova, Artemyeva, Nigmatullina, Tvardovskaya, 2016;). At the same time the formation of predictive competence can serve as a diagnostic indicator of the social adaptation welfare of younger schoolchildren with disabilities (Akhmetzyanova, & Kurbanova, 2017). In this context, the spheres of relations are regarded as the main components of the social development situation for a junior schoolchild. Thus, the structure of the prognostic competence of a child with a deficit type of educational disorders includes the ability to predict learning, relations with peers and a teacher, family relationships, with other adults, virtual relationships (Akhmetzyanova, Artemyeva, & Tvardovskaya, 2017). The basic internal functional characteristics of prognostic abilities are distinguished: these are cognitive, regulative and speech communicative abilities. The quality of the forecast determines a number of bipolar functional characteristics that allow us to empirically assess the level of individual development and forecasting features of the younger schoolchild both with typical development and with developmental disabilities. The authors determine the unit of prediction empirical study – this is the child’s prediction of future events in specific situations typical for the younger pupil (Akhmetzyanova, 2017). Each situation represents a separate sphere of relations, constituting the space of socialization in the younger school age. The behavior of one of the participants in the proposed situation, the same age as the individual studied, contains a violation of the social norm relevant to the younger schoolchild. Each forecast sample can be characterized with the proposed functional characteristics that reflect the prediction features. This set of characteristics is intended for detailed research or for in-depth diagnosis of the prognostic competence of a junior schoolchild with typical and non-typical development in order to set corrective and developing tasks for integrated professional support.

Thus, for the further theoretical and empirical study of the forecasting of younger schoolchildren with ASD, the method ‘The ability to predict situations of potential or real violation of social norms’ was used (Akhmetzyanova, 2017).

4. Purpose of the Study

The results allow to determine the indicators of prediction ability in the context of the described social-adaptive functions as factors determining the effectiveness increase in the behavioral therapy for children with autism spectrum disorders.

5. Research Methods

Research methods: theoretical methods (analysis, synthesis, abstraction and concretization, comparison and generalization, method of induction and deduction, method of analogies, modeling); psychological and diagnostic methods of research (questioning, testing); empirical methods of psychological-pedagogical ascertaining experiment (method of quantitative qualification of the studied object, method of interpretation of the results, method of analysis of the process and products of activity); methods of mathematical statistics and graphical representation of results.

Junior schoolchildren from Kazan schools took part in our empirical study (25 people with typical development and 25 people with RAS). The method ‘The ability to predict situations of potential or real violation of social norms’ was used as a psychodiagnostic tool (Akhmetzyanova, 2017).

This study was conducted in accordance with the Constitution of the Russian Federation, Federal Law № 152-FZ, July 27, 2006, 'About personal data', the Charter of the Russian Psychological Society, the Universal Declaration of human rights, the Helsinki Declaration of the World Medical Association 'Ethical principles for medical research with the participation of people as subjects of research', the international Universal Declaration of ethical principles for psychologists, the ethical metacodex of the European (at present all of the above was fixed in the 'Ethical Code of a psychologist' of the Russian Psychological Society in 2012).

The data from the empirical study were processed using mathematical statistical analysis (SPSS). The reliability of the revealed differences was estimated with the help of Student's t-test, the level of expression of indicators was determined by using the mathematical apparatus of average numbers calculating. Open access to study data is located.

6. Findings

Main research findings:

- there are differences in the overall expression of the socio-adaptive forecasting functions between children with autism and children without autism,

- there are differences in specific socio-adaptive prediction functions between children with autism (d) and children without autism (n) – in regulatory ($X_{av}(n) = 25.1$, $X_{av}(d) = 20.2$), speech-communicative ($X_{av}(n) = 23.1$, $X_{av}(d) = 20.4$), cognitive ($X_{av}(n) = 15.2$, $X_{av}(d) = 13.7$) spheres;

- the obtained results allow to determine the indicators of predictive ability in the context of social adaptation functions as factors determining the behavioral therapy effectiveness increase for children with autism spectrum disorders;

- in educational situations the differences in the structural-functional model of prognostic competence are noted only in the regulatory and cognitive components;

- in extra-curricular situations the differences in the structural-functional model of prognostic competence are noted in the regulatory, cognitive, and speech-communication components of the prognosis.

Particular results of our study:

- an analysis of the average numbers of the indicators, the numbers of the coefficients of variation and statistical comparison of the indicators by the Student's t-test made it possible to identify group differences in the severity of the criteria for predictive competence;

- an analysis of the average numbers of the indicators, the numbers of the coefficients of variation and statistical comparison of the indicators on the Student's t-criterion made it possible to reveal group differences in the severity of the criteria of junior schoolchildren's prognostic competence both in educational and extra-curricular situations;

Differences were studied only with the level of reliability of $p \leq 0.001$.

Tables 1 and 2 show a comparison of the severity of the predictive competence criteria indicators. Indicators from the approved list of the method used, which are typical for a group of junior schoolchildren with typical development and for a group of junior schoolchildren with ASD are presented. Table 1 shows the educational situations; Table 2 shows the extra-curricular situations.

Table 01. Statistical comparison by the t-criterion of indicators of criteria for predictive competence of junior schoolchildren with typical development and junior schoolchildren with ASD in the educational situation

№ and the name of an indicator	Norm (As-1.33 Ex-3.66)	As	Ex	t-criteria actual value	ASD (As=1.33, Ex=3.66)	As	Ex
4 – the indicator of the first criterion of predictive competence of junior schoolchildren – ‘reflection in the prognosis of the attitude for prosocial / antisocial behavior’	0.92	-2.91	6.76	7.298 p≤0.001	0.20	1.41	-0.00
12 – the indicator of the second criterion of predictive competence of junior schoolchildren – ‘attitude for mature / infantile prediction strategies’	1.00	99.99	99.99	7.856 p≤0.001	0.28	0.92	-1.19
31 – the indicator of the eight criterion of predictive competence of junior schoolchildren – ‘rational / irrational prognosis’	0.84	-1.74	1.09	3.893 p≤0.001	0.36	0.55	-1.76

Table 02. Statistical comparison by the t-criterion of indicators of criteria for predictive competence of junior schoolchildren with typical development and junior schoolchildren with ASD in extra-curricular situations

№ and the name of an indicator	Norm (As-1.33 Ex-3.66)	As	Ex	t-criteria actual value	ASD (As-1.33 Ex-3.66)	As	Ex
6 – the indicator of the first criterion of predictive competence of junior schoolchildren – ‘reflection in the prognosis of the attitude for prosocial / antisocial behavior’	0.92	-2.91	6.76	4.976 p≤0.001	0.36	0.55	-1.76
8 – the indicator of the second criterion of predictive competence of junior schoolchildren – ‘attitude for mature / infantile prediction strategies’	0.84	-1.74	1.09	4.733 p≤0.001	0.28	0.92	-1.19
11 – the indicator of the second criterion of predictive competence of junior schoolchildren – ‘attitude for mature / infantile prediction strategies’	0.88	-2.20	2.96	4.826 p≤0.001	0.32	0.73	-1.53
17 - the indicator of the third criterion of predictive competence of junior schoolchildren – ‘an optimistic / pessimistic attitude for building the expected image of the future’	0.76	-1.15	-0.71	5.222 p≤0.001	0.16	1.74	1.09
32 – the indicator of the eight criterion of predictive competence of junior schoolchildren – ‘rational / irrational prognosis’	0.84	-1.74	1.09	5.779 p≤0.001	0.20	1.41	-0.00
68 – the indicator of the twelfth criterion of predictive competence of junior schoolchildren – ‘the	1.00	99.99	99.99	4.342 p≤0.001	0.56	-0.23	-2.02

presence / absence of future-time categories in speech'							
72 – the indicator of the twelfth criterion of predictive competence of junior schoolchildren – ‘the presence / absence of future-time categories in speech’	0.92	-2.91	6.76	3.792 p≤0.001	0.48	0.08	-2.07

Thus, we can make some preliminary conclusions:

- a group of junior schoolchildren with typical development is more prognostically competent both in the case of an educational situation and in the case of an extra-curricular situation (unlike the group of junior schoolchildren with ASD);

- a group of junior schoolchildren with typical development in the educational situation shows a predictive ability, primarily through the indicators of the first, second and eighth criteria of predictive competence, such as ‘reflection of the prosocial behavior attitude in the prognosis’, ‘attitude for mature prediction strategies’, the indicator of ‘rational prognosis’;

- a group of junior schoolchildren with typical development in an extra-curricular situation shows predictive ability, first of all, through the indicators of the first, second, third, eighth and twelfth criteria of prognostic competence, such as ‘reflection in prognosis of the attitude for prosocial behavior’, ‘attitude for mature prediction strategies’, ‘optimistic attitude for building the expected image of the future’, ‘rational prognosis’ and ‘the presence of the future time category in speech’.

7. Conclusion

There are differences in the severity of the socio-adaptive predictive functions between junior schoolchildren with typical development and junior schoolchildren with ASD, the values for the regulatory, cognitive and speech-communicative components of the prognosis are higher in normal group.

The predictive ability of junior schoolchildren with typical development can be described as more oriented towards normative behavior, mature behavior strategies and rationality in constructing a prognosis for the development of the situation, and in the extra-curricular situation their difference from younger schoolchildren with ASD is supplemented by even greater predictive competence through the presence of optimistic attitudes toward the future and the presence of the future tense categories in speech.

Thus, forms and methods of behavioral therapy for junior schoolchildren with ASD can be completed with such an active component with high psychotherapeutic potential as the predictive ability. At this stage of our research we are ready to offer to pay attention to the development of at least three criteria in case of accompanying the child with ASD in the learning situation and at least five in case of correctional pedagogical support in extra-curricular situations. The research has shown that children with ASD are infantile, emotional and pessimistic. Prospects for the development of the chosen direction are very specific – it is to define resource predictive areas for children with ASD and to develop their potential prognosis zones as they are developed in group of children with typical development. At this stage of our study the importance of the predictive ability for behavioral therapy in the context of social adaptation of children with ASD was demonstrated. We also have noted the content of the predictive ability through the revealed reliable differences in the severity of the indicators of the prognosis criteria.

All this determines the practical importance and novelty of our research which is the possibility of forming a social adaptation program and a program of psychological and pedagogical support of junior schoolchildren with autism. Based on that, the ability to predict can become the main therapeutic element and an indispensable resource of social adaptation.

Acknowledgments

The work is performed according to the Russian Government Program of Competitive Growth of Kazan Federal University.

References

- Aarons, M., & Gittens, T. (1995). *The handbook of autism*. L&NY.
- Andronov, V. P. (2015). Value of prognostic abilities for professional self-determination of high school students. In V. P. Andronov, M. S. Ionova. *Integration of education*, 19(1), 118-123. doi: 10.15507/Inted.078.019.201501.118
- Akhmetzyanova, A. I. (2017). *Prognostic competence of younger schoolboys with the limited possibilities of health*. Kazan: Izdatelstvo Kazanskogo universiteta.
- Akhmetzyanova, A. I., & Artemyeva, T. V. (2016). *Psychological practice in educational institutions: program and guidelines*. Kazan: Izdatelstvo Kazanskogo universiteta.
- Akhmetzyanova, A. I., Artemyeva, T. V., Nigmatullina, I. A., & Tvardovskaya, A. A. (2016). Anticipation Phenomenon in the Structure of Deviance: Analytical Research Review. *International Journal of Humanities and Cultural Studies (IJHCS)*, 3(1), 418-425.
- Akhmetzyanova, A. I., Artemyeva, T. V., & Tvardovskaya, A. A. (2017). Features of forecasting and perception of norms by younger students with developmental disorders. *Integration of education*, 21(3), 489–504. doi: 10.15507/1991-9468.088.021.201703.489-504
- Akhmetzyanova, A. I., & Kurbanova, A. T. (2017). Prognostic competence as a resource of socialization of primary school children with deficits to development: key characteristics of the model. *Proceedings of The international scientific conference 'Trends and prospects of modern psychological science and practice'*. Almaty: Kazakh Universitet.
- Barbera, M. L. (2017). *The Verbal Behavior Approach: Education of children with autism and related disorders*. Yekaterinburg: Rama Publishing.
- Delani, T. (2016). *Development of basic skills in children with autism: Effective method of playing lessons with special children*. Yekaterinburg: Rama Publishing.
- Lebedinskaya, K. S., & Nikolskaya, O. S. (1989). *Children with communication disorders*. Moscow: Prosveshenie.
- Lebedinskaya, K. S., & Nikolskaya, O. S. (1987). Special problems of early infantile autism. A basic understanding of the syndrome of early infantile autism. *Defectology*, 6, 10-16.
- Lebedinskii, V. V., & Nikolskaya, O. S. (1990). *Emotional disorders in childhood and their correction*. Moscow: MSU.
- Mendelevich, V. D. (2005). *Psychology of deviant behavior*. SPb.: Rech.
- Morozov, S. A., & Morozova, T. I. (1997). The world behind the glass wall. *Motherhood*, 1, 6-19.
- Nikolskaya, O. S., Baenskaya, E. R., & Libling, M. M. (1997). *Autistic child. Ways to help them*. Moscow: Terevinf.
- Vedenina, M. Y. (1997). Use of behavioral therapy of autistic children to develop skills of everyday adaptation. Communication 1. *Defectology*, 2, 31-40.
- Volkmar, F., & Vaizner, L. (2014). *Autism. A practical guide for parents, family members and teachers*. Moscow: Vyhod.