

The Ability of Visually Impaired Preschoolers to Anticipate Future Situations[▫]

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ABSTRACT

Background. The article deals with the ability to anticipate future events in preschool children with visual impairments. Development of prognostic ability in older preschoolers makes it a significant condition for social and psychological adaptation of children with disabilities, including visually impaired preschoolers.

Objective. To study the anticipation of future events in visually impaired children.

Design. The sample comprised 60 preschoolers aged 5 to 7 years, 30 of them with visual impairments and 30 with unimpaired vision.

Results. Analysis of the structural and functional components showed that visually impaired preschoolers more often predict actions, and have a lower level of the speech and communicative function than normotypical peers. Children with visual impairments are better able to anticipate events in organized activities and in relationships with parents, than with other adults or children.

Conclusion. We demonstrated the specific ability of visually impaired preschoolers to anticipate future situations. We confirmed that children with visual impairments experience difficulties in making a prognosis, and have a lower level of regulatory, cognitive, and speech and communicative functions than their peers who are not visually impaired. Visually impaired preschoolers can set and hold to goals, as well as cope with mentally playing out different options, and are aware of the consequences for themselves and others. They have difficulty understanding and identifying both their own and others' emotions in predictable situations.

Keywords: Anticipation of future situations, prediction, anticipation, children, preschool age, visual impairment

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Highlights:

- Preschool children with visual impairments are able to anticipate the development of future events, however, they have lower indicators of structural and functional characteristics of forecasting relative to children without such pathology
- The inability of children with visual pathology to use language tools in accordance with the speech situation, as well as difficulties in recognizing the emotional states of people around them and understanding their own emotions by children with visual pathology make it difficult for them to predict future situations.
- The underdevelopment of visual perception, the lack of a broad sensory experience of interaction with the outside world in children with visual impairments affects their cognitive prediction function.
- The success of predicting relationships with peers and adult children with visual impairments depends on the degree of regulation of their activities: it is more difficult for children to predict the development of the situation in free activity.

АННОТАЦИЯ

Актуальность. В статье рассматривается проблема способности к предвосхищению событий будущего у детей дошкольного возраста с нарушениями зрения. Актуальность исследования обусловлена тем, что развитие способности к прогнозированию в старшем дошкольном возрасте делает ее одним из значимых условий процесса социально-психологической адаптации детей с ограниченными возможностями, в том числе и слабовидящих дошкольников.

Цель исследования: изучение специфики предвосхищения событий будущего у слабовидящих детей.

Материалы и методы. В исследовании приняло участие 60 дошкольников в возрасте от 5 до 7 лет, среди которых было обследовано 30 детей с нарушениями зрения и 30 детей с сохранным зрением.

Результаты. В результате анализа структурно-функциональных компонентов установлено, что слабовидящие дошкольники чаще прогнозируют действия, а также у них отмечается более низкий уровень сформированности рече-коммуникативной функции по сравнению с ее развитием у нормотипичных сверстников. Способность к предвосхищению у детей со зрительными нарушениями проявляется успешнее в организованной деятельности, а также во взаимоотношениях с родителями, а не с окружающими взрослыми или детьми.

Выводы. В результате исследования была выявлена специфика способности к предвосхищению ситуаций будущего у слабовидящих дошкольников с нарушениями речи. Было установлено, что дети с нарушением зрения действительно испытывают трудности при формировании прогноза, у них отмечается более низкий уровень сформированности регулятивной, когнитивной и рече-коммуникативной функции по сравнению с их развитием у сверстников без зрительных нарушений. Дошкольники с нарушением зрения могут ставить и удерживать цели, а также справляются с мысленным проигрыванием различных вариантов действий и осознают последствия их выполнения относительно себя и окружающих людей. У них имеются трудности в понимании и определении как своих, так и эмоций окружающих людей в прогнозируемых ситуациях.

Ключевые слова: Предвосхищение ситуаций будущего, прогнозирование, антиципация, дети, дошкольный возраст, нарушения зрения

Ключевые положения:

- Дети дошкольного возраста с нарушениями зрения способны предвосхищать развитие событий будущего, однако они имеют более низкие показатели структурно-функциональных характеристик прогнозирования относительно детей, не имеющих такой патологии.

- Incapacidad de los niños con patologías de la visión para utilizar los recursos lingüísticos en consonancia con la situación, así como dificultades en el reconocimiento de estados emocionales de las personas de su entorno y en el entendimiento de sus propias emociones, lo que les dificulta predecir situaciones futuras.
- El subdesarrollo de la percepción visual, la falta de una experiencia sensorial amplia de interacción con el mundo exterior en niños con discapacidad visual afecta su función de predicción cognitiva.

RESUMEN

Introducción. El artículo trata sobre la capacidad de anticipar eventos futuros en niños preescolares con discapacidad visual. El desarrollo de la capacidad de pronóstico en preescolares mayores se convierte en una condición importante para la adaptación social y psicológica de los niños con discapacidades, incluidos los preescolares con discapacidad visual.

Objetivo. Estudiar la anticipación de eventos futuros en niños con discapacidad visual.

Diseño. La muestra estuvo compuesta por 60 preescolares de 5 a 7 años, 30 de ellos con discapacidad visual y 30 con visión normal.

Resultados. El análisis de los componentes estructurales y funcionales mostró que los niños preescolares con discapacidad visual predicen acciones con mayor frecuencia y tienen un nivel más bajo del habla y la función comunicativa que sus pares normotípicos. Los niños con discapacidad visual son más capaces de anticipar eventos en actividades organizadas y en las relaciones con los padres que con otros adultos o niños.

Conclusión. Demostramos la capacidad específica de los niños en edad preescolar con discapacidad visual para anticipar situaciones futuras. Confirmamos que los niños con discapacidad visual experimentan dificultades para hacer un pronóstico y tienen un nivel más bajo de funciones ejecutivas, cognitivas, del habla y comunicativas que sus pares sin discapacidad visual. Los niños preescolares con discapacidad visual pueden establecer y mantener objetivos, así como hacer frente a la representación mental de diferentes opciones, y son conscientes de las consecuencias para ellos mismos y para los demás. Tienen dificultad para entender e identificar sus propias emociones y las de los demás en situaciones predecibles.

Palabras clave: Anticipación de situaciones futuras, predicción, anticipación, niños, edad preescolar, discapacidad visual

Destacados:

- Los niños preescolares con discapacidad visual son capaces de anticipar el desarrollo de eventos futuros, sin embargo, tienen indicadores más bajos de las características estructurales y funcionales de previsión en relación con los niños sin patología.
- La incapacidad de los niños con patología visual para utilizar las herramientas del lenguaje de acuerdo con la situación del habla, así como las dificultades para reconocer los estados emocionales de las personas de su entorno y entender sus propias emociones les dificulta predecir situaciones futuras.
- El subdesarrollo de la percepción visual, la falta de una experiencia sensorial amplia de interacción con el mundo exterior en niños con discapacidad visual afecta su función de predicción cognitiva.

- El éxito de predecir las relaciones con los compañeros y los adultos por los niños con discapacidad visual depende del grado de regulación de sus actividades: es más difícil para los niños predecir el desarrollo de la situación en la actividad libre.

RESUME

Origines. L'article porte sur le problème de la capacité à anticiper les événements futurs chez les enfants d'âge préscolaire déficients visuels. La pertinence de l'étude est due au fait que le développement de la capacité de prédiction à l'âge préscolaire supérieur en fait l'une des conditions importantes du processus d'adaptation sociale et psychologique des enfants handicapés, y compris les enfants d'âge préscolaire malvoyants.

Objectif. L'objectif de cette étude est d'analyser les spécificités de l'anticipation des événements futurs chez les enfants malvoyants.

Mise au point. L'étude a porté sur 60 enfants d'âge préscolaire âgés de 5 à 7 ans, parmi lesquels 30 enfants ayant une déficience visuelle et 30 enfants ayant une vision intacte ont été examinés.

Résultats. À la suite de l'analyse des composants structurels et fonctionnels, il a été constaté que les enfants d'âge préscolaire malvoyants prédisent plus souvent les actions et qu'ils ont également un niveau de formation de la fonction de communication vocale inférieur à celui de leurs pairs neurotypiques. La capacité d'anticipation chez les enfants déficients visuels est plus efficace dans les activités organisées, ainsi que dans les relations avec les parents, plutôt qu'avec les adultes ou les enfants environnants.

Conclusion. À l'issue de cette étude, on a révélé la nature spécifique de la capacité à anticiper les situations futures chez les enfants d'âge préscolaire malvoyants souffrant de troubles de la parole. On a constaté que les enfants déficients visuels éprouvent des difficultés à établir un pronostic et ils ont un niveau inférieur de formation des fonctions régulatrices, cognitives et de communication de la parole par rapport au niveau du développement chez leurs pairs sans déficience visuelle. Les enfants d'âge préscolaire malvoyants peuvent fixer et maintenir des objectifs, et également faire face à diverses options d'action mentales et réaliser les conséquences de leur mise en œuvre pour eux-mêmes et ceux qui les entourent. Ils ont de la difficulté à comprendre et à déterminer à la fois leurs propres émotions et celles des personnes qui les entourent dans des situations prévisibles.

Mots-clés: Anticipation des situations futures, prévision, anticipation, enfants, âge préscolaire, déficience visuelle

Points principaux:

- Les enfants d'âge préscolaire ayant une déficience visuelle sont capables d'anticiper le développement d'événements futurs, mais ils ont des taux inférieurs de caractéristiques structurelles et fonctionnelles de prédiction par rapport aux enfants qui n'ont pas de trouble.
- L'incapacité des enfants déficients visuels à utiliser les moyens de langage en fonction de la situation de parole, ainsi que les difficultés à reconnaître les états émotionnels des personnes qui les entourent et à comprendre leurs propres émotions, les enfants déficients visuels les empêchent de prédire les situations futures.
- Le sous-développement de la perception visuelle, le manque d'expérience sensorielle large d'interaction avec le monde extérieur chez les enfants déficients visuels affecte leur fonction cognitive de prévision.
- Le succès de la prédiction des relations entre les enfants de même âge et les enfants adultes déficients visuels dépend du degré de régulation de leurs activités : il est plus difficile pour les enfants de prévoir l'évolution de la situation dans les activités libres.

Introduction

It is important to study preschoolers' ability to anticipate future situations, because for the successful development of a child of this age, anticipation is closely related to the development of cognitive processes, through which conscious and controlled prognostic processes are formed from unconscious ones (Akhmetzyanova, 2020).

The functional characteristics of prediction were described in studies by Russian scientists on an adult sample. Considering anticipation as an integral property of the psyche, the scientists distinguish three main predictive functions when constructing the functional structure of anticipation and prognostic abilities: regulatory, cognitive, and communicative, in their various combinations (Lomov, 1980). Anticipation is an important mechanism of mental organization, which governs a person's interaction with the outside world. A person's motor activity, purposeful behavior, goal-setting, planning and regulation of activities (the regulatory function of anticipation), the work of perception, attention, imagination, memory, thinking (the cognitive function), and speech processes, social interaction (the communicative function) are built upon spatio-temporal anticipation.

In the works of B.F. Lomov, E.N. Surkov, L.A. Regush, and E.A. Sergienko, the main functions of anticipation are regulative, cognitive, and communicative (Lomov & Surkov, 1980; Regush, 2003; Sergienko, 2006). A.F. Prizyazhnaya (2006) proposes a similar set of functions for the predictive competence of students as one of the main goals of education, highlighting the knowledge-based (cognitive), activity-based (behavioral), and relational (affective) components.

The identification of these aspects in various concepts touches upon issues of internal functioning and the psychological mechanisms of prediction itself, as well as the functional role of prediction in relation to the encompassing whole. Prediction can affect the motor and cognitive spheres, various types of activity, interpersonal and social interaction, the life of the subject as a whole (Prizyazhnaya, 2006).

In a structural-functional model of the prognostic ability of preschoolers, the emphasis was on the internal functioning of prognostic abilities that determine the quality of a child's predictions (Akhmetzyanova, 2021).

The regulatory function in the predictive ability of preschoolers is manifested in the emotional component of prognosis (optimism/pessimism), since by older preschool age, there is an effect of "the completion of actions in the form of emotional anticipation of possible consequences that may arise in the imagined situation when it is completed" (Akhmetzyanova & Artemyeva, 2021, p.6). Also, in predicting the possible development of events, a preschooler can act either as an active subject, on whose actions the outcome of the situation depends, or as a passive person, who does not influence the course of events. However, it should be noted that the source of prognoses is more often an adult. Preschoolers tend to predict under the influence of adult stimulation, since prediction is not yet a vital need for them (Akhmetzyanova, 2021).

The cognitive component reflects thought processes through which the subjects' cognitive activity is connected with their social interaction; it allows them to choose a method of action that is associated with specific conditions and subordinated to the perceived and expected result.

Since the development of preschool children's predictive ability is directly related to the development of thinking and speech, it is worth highlighting the particular aspects of the speech and communicative function of prediction at this age. Verbal anticipation is usually a simple, unextended sentence or a list of verbs. The communicative function, performing the functions of planning and coordinating joint activities, remains a difficult prognostic element for preschoolers (Regush, 2003).

With regard to preschool age, L.A. Regush (2003) distinguishes three periods that are significant for the development of the ability to predict. The younger preschool age may be characterized as a period of the emergence of emotional anticipation; the middle period is the age of its formation, when it becomes inherent in most children; the older preschool age is a period of intensive development of the ability, when the action of anticipation acquires the greatest motivational force.

The intensive development of anticipatory ability among older preschoolers makes it an important conditions for social and psychological adaptation of children with disabilities. This is especially important for children with sensory impairments; it is difficult for them to anticipate the outcome of their activity, since this process is connected with the ability to analyze a situation, identify its key aspects, and track its development. It is difficult for children with disabilities to identify the main thing in a program of action, to hold onto it and bring it to its logical conclusion. Visual impairments affect mental processes and sensory cognition, thereby reducing the possibility of developing the emotional sphere (Akhmetzyanova, 2019). With impaired vision, many components of communication suffer: the expressive (expressiveness of speech, gestures, facial expressions and pantomime) and the perceptual (understanding the state of another person, making contact with them, compiling an image of them). This leads to problems in the interaction of children with visual impairments with their normally sighted peers and, as a result, to problems of the social integration of those with sensory impairments (Akhmetzyanova & Artemyeva, 2020).

Studies by foreign scientists show that in the preschool period, children begin to consider future scenarios, which allows them to plan for the future, but the development of forecasting in the anticipation of danger, for example, remains unexplored (Suddendorf, 2017). Engle and colleagues (2021) suggest that the ability to learn from the results of prediction is fundamental to both social and non-social learning in preschool children.

Essler and colleagues (2020) studied how children's predictions about other children are related to their popularity among their peers, and also how children predicted another child's behavior in various social situations. Mirabile (2018) found that the ability to make general prognoses is an important aspect of children's adaptive social development, along with the role of parental attitudes in children's social adaptation.

A study of the relationship between the prediction of sadness and prosocial behavior in Italian preschoolers is presented in the work of Sette and colleagues (2018).

According to Martin-Ordas (2017), between the ages of 3 and 5, children develop an ability to plan for their own and others' future needs; however, it is very difficult for them to predict future needs that conflict with current ones. The study showed

that only from the age of 5 can children predict future (non-physiological) needs that contradict their current needs.

Kopp and his colleagues, Yangmei and Schubert (Kopp, 2017; Schubert, 2020; Yangmei, 2018) studied preschoolers' affective predictions, depending on their emotional reactions to future events. It was found that children tend to give more negative predictions. Was and Warneken (2017) studied whether children can accurately judge whether they need help with a problem before trying to solve it. Anticipating the need for help requires children to assess both the problem and their knowledge about it. If an existing skill is applicable to a new problem, they do not need to ask the teacher for help.

Paulus and Moore (2017) studied the cognitive basis of the relationship between generosity and happiness at an early stage of ontogeny. The authors emphasize that preschoolers understand the relationship between generosity and happiness, and assessments of the children's emotions are predictive of their subsequent behavior with each other.

Xiong and colleagues were interested in whether children are willing to share their belongings with partners in anticipation of future benefits (Xiong, 2016). The sharing choices of 5-year-old preschoolers take into account the anticipated reciprocity of the recipient, suggesting either self-interested tactical sharing or direct reciprocity in advance of receiving.

Design

Sample

A psychodiagnostic study of the ability of children with visual impairments and their normotypical peers to anticipate future situations was performed at two municipal public preschools: "Kindergarten No. 282 of a combined type in Kazan" and "Kindergarten No. 20 of a general developmental type in the Zelenodolsky municipal district of the Republic of Tatarstan."

There were 60 respondents aged 5–7 years, 30 of them with unimpaired vision, and with 17 girls (57%) and 13 boys (43%). Thirty children were visually impaired, with 22 girls (73%) and 8 boys (27%).

Analysis of the documentation showed that none of the respondents have concomitant developmental disorders, and the intellectual development of both those with intact vision and their visually impaired peers corresponded to the age norm. None of the subjects had severe neurological disorders.

Methods

The "Prognostic Stories" method of A.I. Akhmetzyanova and T.V. Artemyeva was selected as a research tool, which makes it possible to assess the ability of preschool children with normotypical or deficient development to predict future situations. The procedure presents six situations covering relations that are significant for the socialization of preschoolers — "child–adult," "child–parent," "child–child" — in both free and organized activities. These situations present each of the relational domains

that make up the socialization of a preschooler, both in normogenesis and in dysontogenesis. The procedure makes it possible to study such structural components of prediction as “action prognosis,” “utterance prognosis,” and “emotions prognosis,” as well as functional characteristics that reflect regulatory, cognitive, and speech and communicative aspects (Akhmetzyanova, 2020).

The child was presented with two pictures, reflecting successive stages of a situation typical for a preschool child. Then the child was given a blank sheet of paper and asked to continue the story, to predict the development of the situation.

The diagnostic tool, showing the verbal or non-verbal level of the children’s prognostic ability, suggests different strategies for working with them, depending on the level of their verbal development. It seems possible to assess the development of each of the three forecasting functions in various areas of interaction, in both free and organized activity, if the child is able to give a verbal answer, to describe the continuation of the story. However, if the child’s has a low level of development of the verbal function, and is not able to give a verbal answer, then the child is asked to choose one of the two pictures, reflecting the continuation of this story. One of the pictures demonstrates pro-social behavior on the part of the protagonist, and the other expresses anti-social behavior. Since the child gives no verbal response when choosing a suitable picture, the only thing that can be assessed is the child’s ability to single out a norm or a violation of a social norm in the proposed social situation in the child–parent, child–adult, or child–child sphere, in free and organized activity.

The projective nature of the method does not allow us to judge, by the preschoolers’ predictions, their actual behavior in similar situations, but it does reflect the children’s attitudes, their ways of thinking, the level of verbal and communicative “support” for their prognosis.

Research Hypothesis

We hypothesized that in visually impaired preschoolers, due to their limited visual experience, the ability to predict future events will differ from that in children of the same age with unimpaired vision, and that the indicators of structural and functional characteristics of prediction in children with visual impairments will be lower than in those with unimpaired vision.

Objective of the Study

To study how visually impaired preschoolers anticipate future events.

Research Tasks

1. To conduct a comparative analysis of the structural and functional components of prediction in preschool children with visual impairments and their peers with unimpaired vision.
2. To identify the particular features of how preschoolers with visual impairments anticipate future situations.

Results and Discussion

The results of the study were processed using IBM SPSS Statistics 21. A comparative analysis of the structural and functional components of prediction was performed between groups of children with visual impairments and children without developmental disorders. Differences between the two samples of preschoolers were identified using Student’s t-test, with a significance of $p < 0.001$, and are presented below.

Table 1

Comparative analysis of the structural and functional components of prognosis in preschool children with visual impairment and normative development (by Student’s t-test)

	Children with visual impairment (N = 30)		Children with normative development (N = 30)		t	p
	Mean (M)	Standard deviation (SD)	Mean (M)	Standard deviation (SD)		
Structural components (Verbal level)						
Action prognosis	21.77	4.49	22.47	2.05	0.77	0.9
Utterance prognosis	12.27	5.30	16.90	4.05	3.8	1.22
Emotions prognosis	5.47	5.52	7.57	6.81	1.31	1.6
Structural components (Non-verbal level)	0.2	1.09	–	–	–	–
Functional components						
Regulatory function	12.4	3.87	13.73	2.45	1.59	0.84
Cognitive function	6.23	1.48	6.73	1.55	1.28	0.39
Speech and communicative function	8.43	2.55	10.57	2.1	3.53	< 0.001

Table 1 presents the results of a comparative analysis for two components: structural and verbal. It should be noted that among the children with visual impairments, there was one child who used a non-verbal form of response, but since all the children with normative development gave verbal answers, the Student’s t-test for the structural components of the non-verbal level could not be calculated. .

No statistically significant differences were found for any of the three indicators of structural components, between preschoolers with visual impairment and their normotypical peers who gave verbal answers. However, the mean values of all indicators for the preschoolers with unimpaired vision are somewhat higher than for the visually impaired children (see *Figure 1*).

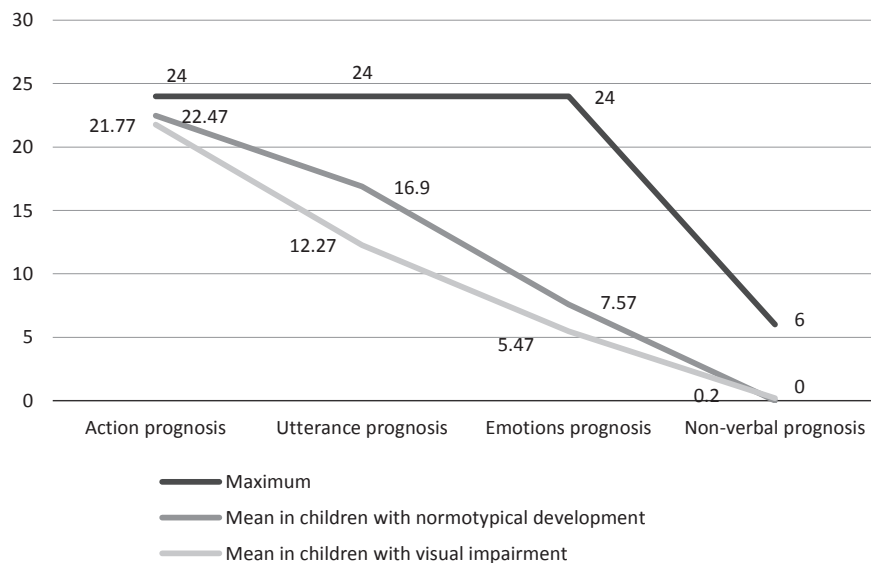


Figure 1. Structural components of prognosis in preschool children with visual impairment and normative development.

Note: Mvi — Mean visually impaired; Mn — Mean normative development.

For the indicator “Action prognosis,” the mean value in the two samples is almost the same (Mvi = 21.77 and Mn = 22.47). It is important to note that all 59 participants in the study who gave a verbal response also made a prediction of the action, with the mean values slightly below the maximum (24). This shows that preschoolers can set and hold to goals, as well as cope with mentally playing out different options for action, and are aware of the consequences for themselves and others.

When we compared the mean values obtained for the indicator “Utterance prognosis” (Mvi = 12.27 and Mn = 16.9), we found that the scores of preschool children with unimpaired vision were somewhat higher than those of visually impaired children. No child scored the maximum possible points. This suggests that the children of both samples have an average ability to anticipate verbal statements in various life situations.

Prediction of emotions in children of both groups, in comparison with other components, is at a lower level of development. We noted differences in mean values (Mvi = 5.47 and Mn = 7.57), as well as the fact that 16 respondents (8 in each sample) out of 59 (27.2%) scored 0 points for this indicator and were unable to anticipate the expression of emotions even after they were asked leading questions.

Most often, the preschoolers in both samples noted the following emotions in their prognoses: sadness, joy, anger, fear. More rarely, they noted pity, surprise, or resentment, for example. It is important to note that the emotions the children cited are, in most cases, negative. For example, two visually impaired preschoolers predicted in all six situations that the protagonists would feel sad. The data indicate that preschoolers, regardless of whether they are visually impaired or not, have difficulty understanding and identifying both their own and others’ emotions in predictable situations.

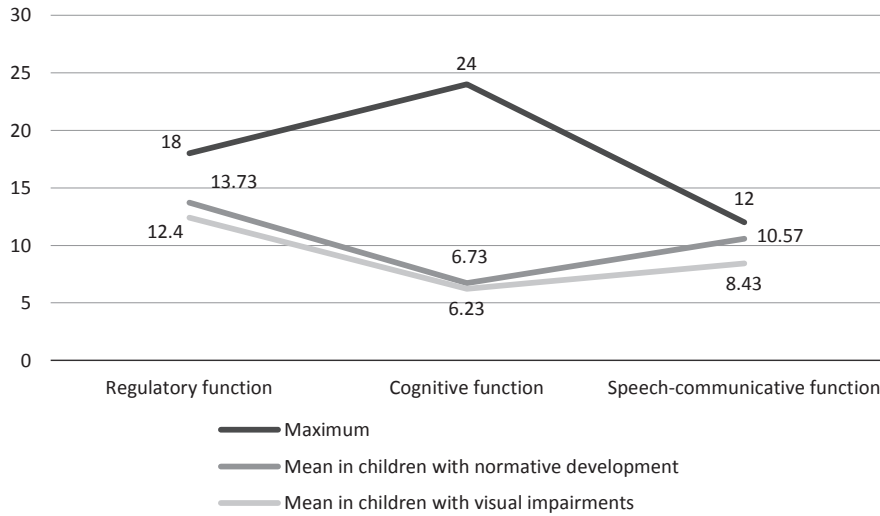


Figure 2. Functional components of prognosis in preschool children with visual impairment and normative development.

Figure 2 presents the results of comparative analysis of the functional components of prognosis, showing statistically significant differences between visually impaired preschoolers and those with unimpaired vision only for the indicator “speech and communicative function” ($M_{vi} = 8.43$ and $M_n = 10.57$). This indicates that verbal communication about predicted events is insufficiently formed in children with visual impairments, and they find it difficult to use language tools appropriately.

For the “Regulatory function” indicator, non-significant differences were found in the mean values ($M_{vi} = 12.4$ and $M_n = 13.73$). Respondents in both samples consciously check their own and other people’s prognostic activity in various situations, aim for socially approved behavior, and frequently take an active position in decision-making. In children with sensory impairments, however, this indicator is lower than the mean value of children with unimpaired vision, which is related to the fact that they are less motivated to act.

For the functional characteristic “Cognitive function,” we found that the subjects have an almost equal mean value ($M_{vi} = 6.23$ and $M_n = 6.73$), which reflects a low level of development of the mental processes through which the subject’s cognitive activity is connected with other objects of interaction. Since visually impaired children have a narrowed view of the world around them, the indicators are also lower than the normative sample.

In the study of the functional characteristics of prognosis, nine criteria were identified, which were grouped into three functions: regulatory, cognitive, and speech and communicative (see Figure 3).

When analyzing the results of the study using Student’s t-test, statistically significant differences were found between visually impaired preschoolers and children with unimpaired vision according to two criteria of the speech and communicative function: “Maximum-minimum verbalization of the prognosis” and “Richness/poverty of speech and language tools.”

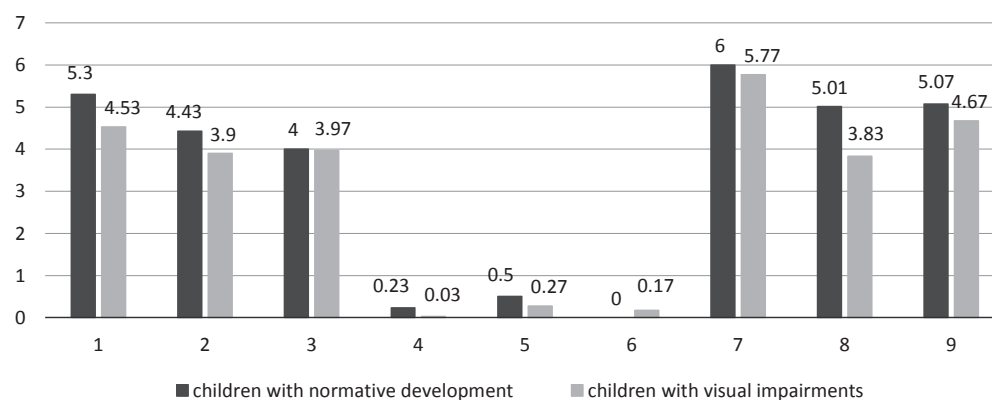


Figure 3. Indicators of prognosis criteria in preschool children with visual impairment and normative development.

Note:

1. Identification of the social norm and adherence to it in the prognosis (1) or violation of the norm and rules in the prognosis (0);
2. Optimistic (1) or pessimistic (0) attitude in the prognosis;
3. Taking an active (1) or passive (0) position;
4. Variance (1) or invariance (0) of the prognosis;
5. Detailed (1) or generalized (0) prognosis;
6. Long-term (1) or short-term (0) prognosis;
7. Realistic (1) or fantastic images (0) of future situations;
8. Maximum (1) or minimum (0) verbalization of the prognosis;
9. Richness (1) or poverty (0) of speech and language tools.

Comparison of the indicators for “Maximum-minimum verbalization of the prognosis” shows us significant differences between the mean values of the two samples ($M_{vi} = 3.83$ and $M_n = 5.01$) and determines the degree of development of the child’s verbal prognosis. Children with sensory impairments more often answered in monosyllabic simple sentences, or sentences with a list of several predicates or only one verb, while normotypical children mostly composed extended sentences or even presented a detailed narrative as the answer to a question.

When analyzing the indicator “Richness/poverty of speech and language tools” ($M_{vi} = 4.67$ and $M_n = 5.07$), we found that preschoolers without visual pathology in most cases composed sentences when making a prediction, demonstrating the ability to use linguistic tools appropriate to the situation. Children with unimpaired vision are more proficient in linguistic means of communication than children with visual impairment.

No statistically significant differences were found for any of the other indicators; however, there was a non-significant difference in the mean values of the two samples.

There were low scores for three criteria.

The data for the indicator “Variant/invariant” prognosis ($M_{vi} = 0.03$ and $M_n = 0.23$) indicate that the preschoolers in both samples most often chose only one way that future situations could develop, only occasionally offering alternatives.

The mean values for the “Detailed/generalized” indicator of prognosis ($M_{vi} = 0.27$ and $M_n = 0.5$) show that this ability is at a low level in the children of both sam-

ples. The children most often gave generalized predictions in their answers, without specifying significant phrases, details, and the feelings of the characters in the stories. Several preschoolers expressed their predictions about how events would develop in more detail, highlighting significant details, phrases, and the feelings of the characters in the stories.

The mean values for the “Long-term/short-term” indicator ($M_{vi} = 0.17$ and $M_n = 0$) reflect the low level of development of this ability in the children of both samples. In most cases, the preschoolers’ answers were a short-term forecast of how situations would develop in the future, limiting themselves to the present situation.

High values were scored for the indicator “Realistic/fantasy” images of the future situation ($M_{vi} = 5.77$ and $M_n = 6$). This shows that in the prognosis, the children with normotypical development, in comparison with their visually impaired peers, always gave realistic images of the future, described the characters to whom various situations occur, projecting situations into real life, without venturing into the world of fantasy.

The children of both samples most often reflect favorable social behavior in their prognosis and follow almost all generally accepted social norms. However, many visually impaired preschoolers have difficulty understanding and anticipating certain events. For example, 13 out of 30 (43.3%) visually impaired preschoolers in one of the situations of interaction with an adult presented in the text would take sweets from a stranger. This shows that not all norms and rules have been assimilated.

Children of both groups gave both optimistic and pessimistic outcomes of future situations, although the children with unimpaired vision gave a positive prognosis somewhat more frequently.

For the indicator “Active/passive,” there was a slight difference between the average values ($M_{vi} = 3.97$ and $M_n = 4$). This demonstrates that the children of both samples more often take an active position and mainly identify themselves as the subject of future events, only sometimes choosing their peers or parents.

Table 2

Indicators of forecasting activity in preschool children with visual impairment and normotypical development

Activity	Children with visual impairment (N = 30)		Children with normotypical development (N = 30)		t	p
	Mean (M)	Standard deviation (SD)	Mean (M)	Standard deviation (SD)		
Organized	12.67	3.63	14.27	2.81	1.9	0.84
Free	14.4	3.15	16.73	2.39	3.23	< 0.001

Using the “Prognostic Stories” method, we were able to compare the functional components of prognosis in visually impaired children and their peers with unimpaired vision in organized and free activities (Table 2), as well as in various areas of interaction with other people (Table 3).

Analysis of the results of the study using Student's t-test indicates that statistically significant differences were found between preschool children with visual impairment and their normotypical peers for the indicator "Free activity" ($M_{vi} = 14.4$ and $M_n = 16.73$). In visually impaired children, this indicator is lower because, due to their visual defect, adults often give them more attention throughout their childhood. As a result, free activity slows down and it becomes difficult for the children to show independence, or to take the initiative in interacting with those around them.

The indicator "Organized activity" refers to activity organized by teachers, depending on the goals and tasks they plan to accomplish, and also shows their ability to organize it effectively. Although no statistically significant differences were found, there was a slight difference between the means of the two samples ($M_{vi} = 12.67$ and $M_n = 14.27$). This shows that it is more difficult for children with visual impairments than for their normotypical peers to adapt to environmental conditions. They often require longer to complete tasks and need additional prodding to concentrate, constant reassurance from the people around them.

Table 3

Indicators of the areas of prediction in preschool children with visual impairment and with normotypical development

Interaction	Children with visual impairment (N = 30)		Children with normotypical development (N = 30)		t	p
	Mean M	Standard deviation SD	Mean M	Standard deviation SD		
Child-parent	9.07	2.23	10.5	1.5	2.92	< 0.001
Child-adult	8.63	2.55	9.67	1.88	1.78	0.58
Child-child	9.37	2.46	10.87	2.03	2.58	< 0.001

The above indicators of the areas of prediction reflect the strategies of the child's behavior in interaction with other people, that is, with parents, other adults, and peers. Statistically significant differences were found between visually impaired children and their peers who develop within the normal range for such indicators as "Child-parent" and "Child-child."

In the interaction "Child-parent" ($M_{vi} = 9.07$ and $M_n = 10.5$), the parent takes responsibility for the outcome of ongoing events. In children with visual impairments, this indicator is lower than with normotypical preschoolers, which is due to the fact that the children often shift responsibilities to their parents.

The "Child-child" interaction is characterized by shifting responsibility for the result of ongoing events to other children. These differences in mean values ($M_{vi} = 9.37$ and $M_n = 10.87$) may be due to insufficient proficiency in communication skills with peers, which makes it difficult to interact due to their sensory impairments.

Insignificant differences were found between the two samples in the mean values ($M_{vi} = 8.63$ and $M_n = 9.67$) in the "Child-adult" interaction. This shows that the children with visual impairments most often reflect favorable social behavior in their

prognosis. However, many children have difficulty understanding and anticipating some events; for example, difficulties arose in a situation described in the method related to accepting gifts from unknown adults. This shows that the children had not assimilated all norms and rules.

Conclusion

The results of the study confirmed our hypothesis about the specific features of prediction in preschool children with visual impairments. We confirmed that visually impaired children experience difficulties in making a prognosis.

Visually impaired preschoolers can set and hold to goals, as well as cope with mentally playing out different options, and are aware of the consequences for themselves and others. The children with visual impairment have difficulty understanding and identifying both their own and others' emotions in predictable situations, which may be associated with the special features of their development in interpersonal relations, due to the uneven formation of their mental functions.

Visually impaired preschoolers have a lower level of structural and functional prediction. Low indicators for the cognitive function of prognosis are due to the underdevelopment of visual perception, the lack of a broad sensory experience of interaction with the surrounding world, of the interrelation of the concrete and the abstract in analyzing a situation. The greatest differences (statistically confirmed) between visually impaired children and their peers were found in the verbal and communicative function of prognosis, along with the inability of children with visual impairment to use linguistic tools according to the situation, and the minimal verbalization of their answers.

The results complement and expand our understanding of the general and specific patterns of development in conditions of deficient dysontogenesis, and also allow us to determine optimal ways to socialize children with visual impairments, to help teachers and speech pathologists to rationally shape a remedial and developmental process.

Informed Consent from the Participants' Legal Guardians

Written informed consent to participate in this study was provided by the participants' legal guardian/next of kin.

Conflict of Interest

The authors declare no conflict of interest.

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