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How do Eye Movements and Visual Attention in Letter-Finding Tasks Differ in Children with Different Levels of Reading Skills?

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Abstract. Children with different levels of reading proficiency demonstrate different information processing speed, reading accuracy and cognitive strategies. The study presents the results of analyses of eye movement features when performing letter search tasks in lexical and sub-lexical environments. The task of searching for a particular grapheme by the respondents is approximated to real-life conditions, since in the course of language learning students regularly face the tasks of searching for certain orthograms in educational texts or self-checking tasks (i.e., errors in their own texts), which is especially important for children with dysorphographia, regulatory dysgraphia, and other learning difficulties. Forty-nine children aged 9 to 10 years participated in the study. Reading skills were assessed using the Standardized Assessment of Reading Skills (SARS). Nonverbal intelligence was assessed by using Raven's coloured progressive matrices. Participants performed a letter search task in text and letter list, eye movements were recorded using the EyeLink 1000 Plus eye tracker. Rank correlation analyses showed that the level of reading skill development was related to the efficiency of finding specific items in a given context. In addition, the duration and number of gaze fixations on the searched units in the letter list were not always related to the number of correct answers, indicating a complex process of visual attention during the search task. In addition, it was observed that foveal vision was not always necessary for performing search tasks in children with normally developed reading skill levels. The study also investigated the concept of functional visual field and how the surroundings of the items being searched affect the attentional mechanisms involved in visual search. Overall, this study provides evidence on the relationship between reading skills, attention and visual information processing, which contributes to understanding reading strategies in children with dyslexia and creating new methods for screening children with dyslexia in the future.

Keywords: dyslexia, letter-finding tasks, eye tracking, visual information processing, reading skills, attention, functional visual field

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Существуют ли различия в движениях глаз при выполнении задач на поиск букв у детей с разным уровнем развития навыка чтения?

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Аннотация. Дети с разным уровнем сформированности навыка чтения демонстрируют разную скорость обработки информации, точность прочтения текстов и когнитивные стратегии. В исследовании приводятся результаты анализа особенностей движения глаз при выполнении заданий на поиск букв в лексическом и сублексическом окружении. Задача поиска определенной графемы респондентами приближена к реальным условиям, поскольку в ходе изучения языковых дисциплин учащиеся регулярно сталкиваются с задачами поиска тех или иных орфограмм в учебных текстах или с задачами самопроверки (т.е., ошибок в собственных текстах), что особенно важно для детей с дизорфографией, регуляторной дисграфией и другими трудностями обучения. В исследовании приняли участие 49 детей в возрасте от 9 до 10 лет. Навыки чтения оценивались с помощью Стандартизированной методики исследования навыка чтения (СМИНЧ). Невербальный интеллект оценивался с помощью цветных прогрессивных матриц Равена. Участники выполняли задание на поиск букв в тексте и списке букв, движения глаз регистрировались с помощью айтрекера EyeLink 1000 Plus. Ранговый корреляционный анализ показал, что уровень развития навыков чтения связан с эффективностью поиска конкретных элементов в определенном контексте. Кроме того, длительность и количество фиксаций взгляда на искомых единицах в списке букв не всегда были связаны с количеством правильных ответов, что свидетельствует о сложном процессе зрительного внимания в ходе выполнения поисковой задачи. Кроме того, было замечено, что фовеальное зрение не всегда обязательно для выполнения поисковых задач у детей с нормально развитым уровнем навыка чтения. В исследовании также изучались концепция функционального зрительного поля и то, как окружение искомых элементов влияют на механизмы внимания, задействованные в зрительном поиске. В целом данное исследование позволяет получить сведения о взаимосвязи между навыками чтения, вниманием и обработкой визуальной информации, что способствует пониманию читательских стратегий у детей с дислексией и созданию новых методов скрининга детей с дислексией в дальнейшем.

Ключевые слова: дислексия, задачи на поиск букв, айтрекинг, обработка визуальной информации, навыки чтения, внимание, функциональное поле зрения

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Introduction

Dyslexia is a neurodevelopmental disorder characterized by slow and/or inaccurate reading, which continues to adulthood, despite intact nonverbal general abilities and exposure to the written language and remediation over the years [1].

Dyslexia affects approximately 3 % to 17 % of the population depending on the language. So, it is reported to range from 5.0 % to 17.5 % of school-aged children whose native language is English and it is around 3.45 % in China [2].

One of the practical tasks that primary school children face is the ability to find and identify individual letters in a text or a list of letters. Moreover, letter finding tasks are often found in remedial programs for children with reading disorders [3; 4]. However, there is no oculographic data on how elementary school children without and with reading disabilities perform on the letter-finding task. Understanding how normotypic and dyslexic children perform these tasks can add insight to intervention strategies.

In recent years, research efforts have been directed toward investigating the cognitive mechanisms underlying visual search tasks and letter search tasks [5–8]. These tasks involve visual search tasks, visually scanning a text or a list of letters to identify a specific target letter. In these tasks the performance of children with dyslexia remains a topic of interest.

The hypothesis of sluggish attentional shifting (SAS) has been proposed as a potential explanation for the challenges dyslexic individuals face in processing rapid stimulus sequences [9]. The findings from several studies suggest that individuals with dyslexia exhibit deficits in endogenous orienting (tasks, whereby shifts of attention are under volitional control) [5; 10; 11]. Their performance on a visual search task involving stimuli that triggered exogenous orienting (In which an automatic shift of attention is elicited in response to peripheral cues) was comparable to that of a control group. However, when faced with a visual search task that required endogenous orienting, the dyslexic group performed worse. In another study [6] researchers employed the Attentional Network Task [7], which permits the separation of alertness, orienting, and executive control effects. No significant differences between dyslexic adults and controls were observed

in terms of alerting effects and executive control. But dyslexic individuals struggle with directing their attention in the peripheral visual field.

The current study aims to bridge the existing gap in the literature by examining and comparing the performance of children with and without dyslexia in letter search tasks. By doing so, the study seeks to explore potential differences in processing speed, accuracy, and cognitive strategies employed by these two groups. Additionally, the research will investigate whether children with dyslexia exhibit unique patterns of eye movements during letter search tasks, as eye-tracking methodologies can provide valuable insights into attention allocation and visual scanning patterns. The findings of this study have the potential to enhance our understanding of dyslexia's impact on visual processing and inform the development of targeted interventions to improve reading and related skills in children with dyslexia.

Methods

Participants

This study involved 49 children, 22 girls and 29 boys (summarized in Table 1 and 2) ages 8 years 7 months to 11 years 7 months (mean = 9 years 11 months; median = 9 years 10 months; SD = 10,7). Of these, 15 were second graders (average age 8 years 11 months), 18 were third graders (average age 9 years 10 months) and 16 were fourth graders (average age 10 years 10 months). They did not have any diagnosed neurological disorders (according to parents), visual impairments, or auditory analyser disorders. The participants were from regular Kazan primary schools; their families had middle socioeconomic status. The parents of all children gave informed consent for them to participate in the study. Kazan is a bilingual region, so it was quite expected that some of the respondents are bilingual (18 children out of 49). However, all children are taught in Russian and, according to the parents' survey, Russian is the dominant language for all of them.

Written informed consent forms were signed by parents or legal representatives of the children; children also orally agreed to participate. The study was approved by the Committee on Ethical Assessment of Empirical Research, Kazan State University, Russia.

Table 1

Grades

Grade	Counts	% of Total
2	15	30.6 %
3	18	36.7 %
4	16	32.7 %

Table 2

Gender of participants

Gender	Counts	% of Total
boy	27	55.1 %
girl	22	44.9 %

Источник: здесь и далее — исследование автора.
Source: here and further — author's research.

Measures

The assessment of reading skills was conducted using the only available standardized test for the assessment of reading skills in Russian-speaking children: the Standardized Assessment of Reading Skills (SARS) in Russian [12]. We used the model proposed by the authors of the methodology to categorize children into groups (normotypical readers, at-risk group, children with dyslexia): non-pathological forms of reading delay should be considered within one standard deviation of the mean reading fluency score for the corresponding grade level, and that scores below one and a half standard deviations of the mean should be considered to belong to the spectrum of dyslexia. We are aware that there is new data on SARS in 2018 [13], but we have relied on the norms suggested by the authors of the methodology. We relied only on one diagnostic criterion — the speed reading. We recorded but did not assess reading comprehension in this study.

Non-verbal intelligence was evaluated using the Raven's colored progressive matrices. Additionally, we investigated the eye movements of the participants while they performed a task involving letter search in a text and a list of letters.

Text with a readability level 39 % (for grades 3–4) [14] and a list of letters displayed on the screen were used as stimulus material. The children read the text twice: in the first reading, the participants were not tasked with finding the letter; in the second reading, the participants were tasked with finding all the letters D. After the first reading of the text, the participants were told what task they would be asked to do on the second reading of the text. This will allow us to analyse how the gaze movement strategies of children with different reading skills change when different tasks are assigned during reading. The text contained 440 characters, 73 spaces, 342 letters, 69 words, 8 sentences; there are no words with more than 4 syllables, 69 words up to 4 syllables, 8.63 words per sentence on average, 2.12 words on average per sentence. The number of characters with spaces in the text and the list of letters coincided (440 signs). The respondents were tasked to find the letter D (Д in Russian) in the text and in the list of letters, the number of which also coincided and was equal to 8. Children read an excerpt from L.F. Voronkova's story "How the Christmas tree was decorated". The text was adapted to the tasks of the study: in order to make the number of letters to be searched for the same in the text and the word list, we removed two lexemes containing these letters without changing the meaning of the sentence. 80 % of the text's vocabulary is included in the list of 5000 most frequent words of Russian children's literature [15]. The frequency of two nouns was less than 6 ipm: *gornitsa* (ipm — 5.4), *prigorshnya* (ipm — 2.6) [16]. We have considered in detail the characterization of the frequency of lexemes in the text, since the high frequency of most lexemes in the text creates conditions for the implementation of the direct access algorithm. Readers use two strategies: phonological recoding occurs when reading low-frequency words, but reading

high-frequency words is realized holistically [17]. Since high-frequency units are perceived holistically by the reader, we hypothesize that finding units in the lexical environment will be difficult for good readers (compared to searching for units in a list of letters) who are less likely to resort to the phonological recoding route. The next task of searching for a letter in a list of letters, which is described just below, does not involve the direct access route because context is excluded.

The task of finding a particular letter among others is a modified Bourdon-Wiersma test [18]. The Bourdon-Wiersma test involved in this study requires participants to identify and select a cluster of dots from a sheet comprising 50 lines of dot patterns. These dot patterns consist of groups of 3, 4, or 5 dots. However, in the current study the context in which the units sought are found is different. The list of letters displayed on the screen was the second stimulus material for respondents. The number of characters with spaces in the list of letters was equal to the number of characters in the text (440). The list contained 8 letters Д and 8 letters Л, as well as other letters of the Russian alphabet. All letters were arranged in random order in the form of strings. The number of Д letters to be searched for was also the same (8). The number of optically similar letters (Russian letter Л) in the list of letters also coincided with the number of Д letters.

Therefore, the task for the informants was to find the letter D (Д in Russian) in the text and in the list of letters and name their number (8) to the experimenter. Participants were provided with detailed instructions for the experiment; then the researchers were asked to go through a training session after going through the calibration and validation procedures. For a more accurate registration of all parameters of gaze movements, a tower was used to fix the head. The letters were printed in black on a white background, using the Courier New monospace font, which was 26 pt. Monospace fonts are inferior to proportional fonts in the task of increasing the accuracy of letters recognition by readers [19].

The tasks were presented on a computer screen. Eye movements were recorded. The necessary adjustment of the equipment was carried out: calibration and validation by nine points. The first task was reading a text. The second task was to find the letters D in the text (both lowercase and uppercase); the instruction was presented by ear and as text on the screen. The respondent had to name the number of letters found to the experimenter.

Participants were seated on a comfortable chair in a darkened room. Eye movements were recorded using the EyeLink 1000+ equipment (SR Research), sampling rate 1000 Hz. The informant sat at a distance of 70 cm in front of a 22-inch screen (1920 x 1080). The eye movements were processed using the DataViewer software (SR Research). The experiment was run through Experiment Builder.

When conducting behavioural techniques, we assessed the following parameters (Table 4): reading technique coefficient (CoRT), accuracy of responses when naming the number of letters in the list of letters (Acc_L) and in the text (Acc_T). (Several children (4 out of 49) named the number of units searched for in the letter list as greater than 8. The oculomotor patterns of these 4 children should probably be analysed in more detail). We also assessed the following gaze movement parameters: number of fixation on words with the letter/letters D in the text at the first reading (without letter search task) (NF_WD_1), number of fixation on words with the letter/letters D in the text at the second reading (with letter search task) (NF_WD_2), total viewing time (msec) on words with the letter/letters D in the text at the first reading (without letter search task) (DT_WD_1), total viewing time (msec) on words with the letter/letter D in the text at the second reading (with letter search task) (DT_WD_2), total viewing time (msec) on the letters D in the list of letters (DT_LD) and total viewing time (msec) on the letters L in the list of letters optically similar to D (DT_LL).

The significance of the normal distribution was determined using the Shapiro-Wilk test. The One-Way Analysis of Variance with nonparametric Welch's Assumption was used to analyze the parameters of gaze movement in different groups. Spearman correlation analysis was used to identify the relationship between the variables.

Results and Discussion

Being based on the primary analysis, the study examined the reading technique coefficients (Table 3) of the children under investigation (M — 90,8; SD — 16.6) [12]. The diagnostic examination yielded notable findings, indicating that out of the total sample of 49 children, 12 exhibited signs of dyslexia. These children displayed low coefficients of reading technique, which are characteristic of dyslexia. Importantly, their non-verbal intelligence remained intact, their speech development was normal, and there were no apparent auditory or visual perception disorders. Clinical psychologists and speech therapists at the Centre for Speech Pathology of the Scientific and Clinical Centre for Precision and Regenerative Medicine of Kazan Federal University confirmed dyslexia in these 12 children. Additionally, the study identified that 11 children out of the 49 demonstrated a non-pathological delay in the development of reading skills. Finally, 26 children out of the 49 exhibited reading indicators within the range of average statistical norms. These findings provide a preliminary understanding of the distribution of reading abilities within the studied group.

The Jamovi package was used for statistical calculations. The distribution in the sample is non-normal (Shapiro-Wilk test), so parametric analysis of variance with Welch's correction was used for further analysis.

Table 3

Coefficients of reading technic (CoRT) and age of participants

Value	CoTR	Age
N	49	49
Mean	90.8	119
Median	93	118
Standard deviation	16.6	10.7
Minimum	56	103
Maximum	133	139

We hypothesize that children with high reading proficiency have more accurate letters in the list of letters retrieval than dyslexic and at-risk children. But we also hypothesize that finding units in the lexical environment will be difficult for good readers (compared to searching for units in a list of letters) who are less likely to resort to the phonological recoding route. In order to test this hypothesis, we applied One-Way Analysis of Variance with nonparametric Welch's Assumption. Significant differences were found in letters retrieval accuracy in all three groups, but only in the letters list condition (Welch = 6.98, p = 0.004). But no significant differences were found in unit search accuracy in the semantic environment condition (Welch = 1.76, p = 0.199).

Analyses of posterior differences (Games-Howell test) revealed that children with non-pathological reading delays (R) were more successful at grapheme retrieval than children with dyslexia (D) (p = 0.004). Also, children with normal reading skills (N) performed more accurately on the grapheme retrieval task in the letter list condition than children with dyslexia (p = 0.015). Thus, the hypothesis was partially confirmed. It is likely that the strategy of unit retrieval varies depending on the presence of context, so differences in children with different levels of reading skill development will not be so obvious, since children with high reading skill are less likely to use the phonological decoding route and more likely to use the direct access route. Consequently, children with more developed reading skill will be distracted by semantic space. It is necessary to investigate the influence of programming and control functions on the task of visual search for a given unit in a lexical environment.

The results of the study indicate that children with higher reading skill levels exhibit a greater degree of success in the task of locating specific items within a given list. In contrast, children with lower reading skill levels demonstrate a less effective strategy when searching for the designated items. This finding suggests that children with underdeveloped reading skills may possess lower levels of concentration and

sustained attention compared to their peers with stronger reading abilities. These findings align with prior research conducted in the field, further supporting the notion that reading proficiency is closely tied to attentional abilities and the capacity for sustained focus [4].

Table 4

Games-Howell Post-Hoc Test — Accuracy (In the list of letters)

Letter	Value	D	R		N	
D	Mean difference	—	−0.248	**	−0.1987	*
	p-value	—	0.004		0.015	
R	Mean difference		—		0.0494	
	p-value		—		0.571	
N	Mean difference				—	
	p-value				—	

Note. * p < .05, ** p < .01, *** p < .001

The main parameters of gaze movement analyzed were the number of fixations on the areas of interest and the total duration of gaze on the areas of interest. We expected that the number of gaze fixations on the searched letter would be equal to the number of searched letters that the respondent found in the list of letters. However, subjects were not asked to fixate their gaze on the unit they were looking for, they only had to name the number of letters they found. We obtained the following results: 6 respondents (12.2 %) had a response equal to the number of fixations on the searched units in the list of letters, 36 respondents (73.1 %) had fewer fixations on the relevant areas of interest than the number of letters found, and finally, 7 respondents (14.7 %) had more fixations on the relevant areas of interest than the number of letters found. All this suggests a complex and ambiguous process of attention, visual attention during the search task. We assumed that the accuracy of fulfilment of the search task (the number of found graphemes) is not always related to the number of fixations on the corresponding areas of interest, since, according to some data, the parafovea is also involved in the visual search task.

Consequently, the involvement of central foveal vision in the search task is optional in children with highly developed reading skills. This idea that foveal vision is optional in the search task is supported by research [20]. The necessity of high-acuity foveal vision for achieving normal search performance in naturalistic scenes has been challenged. Surprisingly, when individuals performed a search task with artificially impaired foveal or central vision, their search performance remained largely unaffected. While participants were able to successfully locate the search object in the scene, they encountered difficulties in accurately confirming the target's identity when searching

without central vision. These intriguing findings indicate that visual search in naturalistic scenes relies less on foveal vision than previously believed, suggesting a potentially greater role for peripheral vision in guiding search behavior. Moreover, the study emphasizes the significance of contextually relevant search targets within naturalistic scenes and underscores the influence of attention in visual search processes. As a result, these findings advance our comprehension of the underlying mechanisms involved in visual search within naturalistic environments.

There is also the idea of a functional visual field. The concept of the functional visual field (FVF) or useful field of view (UFOV) is relatively straightforward [21]. It acknowledges our inability to process the entire visual field simultaneously. To account for this limitation, the idea of a FVF proposes a region surrounding the point of fixation within which visual processing occurs, while outside this region, processing does not take place. As an example, G.J. Andersen, R. Ni et al., state that "Any information that falls within the UFOV is processed whereas any information that falls outside of this region is not processed" [22].

However, the results of the current experiments indicate that the FVF is more complex than this initial understanding. Firstly, we observe and process stimuli across the visual field beyond the boundaries of the Attentional FVF [20], [23]. Secondly, it has always been evident that the characteristics of the task and stimuli influence the FVF. The present experiments highlight this aspect using basic visual search tasks. The influence of the task on the FVF becomes more apparent and significant in real-world search tasks. For instance, the FVF will change depending on whether a person is looking for their given spelling in the task text or an error in their own text, which is especially important for children with learning difficulties. The task of searching for a certain grapheme by the respondents is close to real conditions, because in the course of learning language disciplines, students regularly face the tasks of searching for certain orthograms in educational texts or the tasks of self-checking (i.e., errors in their own texts), which is especially important for children with dysorphographia, regulatory dysgraphia and other learning difficulties.

There is a discernible pattern as to what the observers process in the functional visual field [24]. The observers are more likely to detect a target that is situated close to their current point of fixation. Furthermore, in these experiments, observers demonstrate a higher likelihood of locating the target when it appears to the left or right of fixation compared to other directions. This finding may be linked to the organized, grid-like arrangement of the stimuli, which potentially prompts observers to search along rows, akin to reading a display [25], [26]. However, it is worth noting that a horizontal bias in saccades has also been observed in search tasks featuring items arranged in more random arrays [27]. Although we did not analyse this bias when examining the data for the element search in the letter list, it remains possible that specific search

tasks and individual searchers interact in ways that yield idiosyncratic patterns of covert attention during fixation. Nevertheless, obtaining robust evidence to support such a hypothesis would necessitate extensive data collection efforts.

We assume that reading strategies will be different in the studied groups depending on the type of task set before the respondents. The analyses showed that significant differences between the groups were present only in terms of the total duration of fixations and total number of fixations on the areas of interest during the initial reading of the text without establishing a search task (DW_WD_1: Welch = 8.78, p = 0.003), (NF_WD_1: Welch = 14.16, p = 0.001). Analyses of posterior differences (Games-Howell criterion, Table 5, 6 and 7) revealed that dyslexic children had longer fixations on given lexemes than children in the at-risk group (p = 0.018) and in the typical readers group (p = 0.005); and also dyslexic children had a greater number of fixations on given areas of interest compared to the typical readers group (p < 0.001). However, the establishment of a search task apparently alters reading strategies, as there were no significant group differences (DW_WD_2: Welch = 1.37, p = 0.276); (NF_WD_2: Welch = 1.43, p = 0.263).

Table 5

Games-Howell Post-Hoc Test — DT_WD_1

Letter	Value	D	R		N	
D	Mean difference	—	12069	*	14532	**
	p-value	—	0.018		0.005	
R	Mean difference		—		2463	
	p-value		—		0.290	
N	Mean difference				—	
	p-value				—	

Note. * p < .05, ** p < .01, *** p < .001

Table 6

Games-Howell Post-Hoc Test — NF_WD_1

Letter	Value	D	R	N	
D	Mean difference	—	13.2	22.69	***
	p-value	—	0.075	< .001	
R	Mean difference		—	9.47	
	p-value		—	0.061	
N	Mean difference			—	
	p-value			—	

Note. * p < .05, ** p < .01, *** p < .001

Oculomotor strategies differ in terms of the total viewing time on the D unit sought (Welch = 1.43, p = 0.263); there are differences between the at-risk group and the dyslexic group (Table 8), having a longer total viewing time on the letter sought in the grapheme list (p = 0.003).

Table 7

Games-Howell Post-Hoc Test — DT_LD

Letter	Value	D	R		N
D	Mean difference	—	3135	**	1826
	p-value	—	0.003		0.112
R	Mean difference		—		–1309
	p-value		—		0.073
N	Mean difference				—
	p-value				—

Note. * p < .05, ** p < .01, *** p < .001

Finally, the Russian letter Д/D is similar to the letter Л/L in printed texts. We analyzed how similar the parameters of gaze movement we considered are when respondents work with a list of letters. Correlation analysis showed that the relationship between the indicators of total viewing time on the letters D and L is significant and positive (ρ = 0.530, p = 0.001). Distinguishing optically similar letters is not an easy task, especially for children with visual-spatial difficulties. Given the direct correlation between total viewing time on these optically similar graphemes in the whole sample, we can assume that children with different reading skills have difficulties in performing the search task in the presence of optically similar units. However, these assumptions should be strengthened by further analysis of oculomotor activity during recognition of letters that are not optically similar to the searched unit.

Longer total duration of fixation on the sought units and at the same time relatively low percentage of correct answers about the number of units in the presented lists of letters correlates with the hypothesis of sluggish attentional shifting. Numerous studies have revealed notable differences in the temporal aspects of attentional orienting between dyslexic individuals and control groups. The hypothesis of sluggish attentional shifting (SAS) has been proposed as a potential explanation for the challenges dyslexic individuals face in processing rapid stimulus sequences [27]. Notably, this hypothesis has garnered support for its applicability in both the visual and auditory modalities [28; 29]. Additionally, the SAS hypothesis offers insights into the frequently observed response delays among dyslexic participants.

Conclusions

We conducted the analysis of the indicators of reading skill level and some aspects of oculomotor activity in children performing the task of searching for a letter in different environments (text and a list of symbols), as well as the level of success in performing the search task. The results of the analysis showed that children with a more developed reading skill were more successful in finding the sought unit in the list of symbols, than children with dyslexia and the risk group.

The next stage of the analysis could be not only the study of fixations on areas of interest, but also fixations on areas close to the areas of interest, since, according to research, peripheral vision is also involved in the search task. Analysis of variance showed that children with developmental dyslexia fix their eyes for longer and more often fix their eyes on areas of interest compared to children from the risk group and the group with normal reading skills, but the number of correct answers to the question about the number of given units in the list of letters is lower.

Thus, it becomes obvious that when performing a search task, the environment of the searched unit is important. This is probably due to the fact that semantic activation is not only an automatic process, but is also influenced by regulatory functions, the level of development of which also depends on the level of reading skill formation. It is necessary to study the relationship between programming and control functions and the ability to perform search tasks in different lexical and sub-lexical environments.

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