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Dear Readers!

Here we present the spring issue of the journal “Psychological Science and Education” (No, 2—2024). The issue consists of two sections, “Developmental Psychology” and “Psychology of Education”.

The section “Developmental Psychology” opens with a study on the correlation between creative thinking and initiative preschoolers from different educational environments express while playing. The theme of development continues in the research on the analysis of oculomotor movements in reading educational text and the practice of using metacognitive strategies by older students. Results show that older students actively use strategies to solve reading problems, but rarely use supportive strategies. The last article in the section is a study of disobedience among high school students in Nigeria, which shows how home control and religiosity are related to the behavior of adolescents.

In the section Psychology of Education, there are studies on motivation and readiness for mentoring among general education teachers. It is shown that teachers have similar characteristics of readiness for mentoring, and that the level of teachers' motivation is related to the success of the implementation of the mentoring system in school. The next article is about the peculiarities of psychological defenses and coping strategies of the teachers of preschool institutions with different levels of psychological well-being. The section closes with a study of the influence of mindfulness on academic performance among international students in China.

We hope that our readers will find the new issue of the journal Psychological Science and Education interesting.

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The Interrelation between Initiative in Play and Dialectical Thinking in Preschool Age

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In the article play is considered as a space for the development of creative (dialectical) thinking in preschool age. The aim of the study is to analyze the relationship between the success of children in solving creative (dialectical) tasks and initiative in spontaneous play. The study involved 57 preschoolers from 2 preschool groups, contrasting in the quality of the educational environment. A qualitative and quantitative analysis of the initiative in play was carried out using an observation tool developed on the basis of the methodology of E.O. Smirnova. A total of 14 videos of a joint play were analyzed. “What can be simultaneously at the same time”, “Dialectical stories”, “Three stories” were used to measure the level of creative (dialectical) thinking. Qualitative analysis made it possible to distinguish two types of initiative actions — maintaining and changing the course of play. The study revealed the correlation between creative thinking in children’s narratives and play-changing initiative. The study points to the value of play as an activity where the child can not only solve, but also set tasks.

Keywords: preschool age; play; initiative; creative thinking; dialectical thinking.

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Взаимосвязь инициативы в игре и диалектического мышления у дошкольников

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Представлены материалы исследования, посвященного проблематике игры как пространства развития творческого (диалектического) мышления в дошкольном возрасте. Цель исследования — проанализировать взаимосвязь между успешностью решения детьми творческих (диалектических) задач и проявлением инициативы в игре. В исследовании приняли участие 57 дошкольников из 2 дошкольных групп, контрастных по качеству образовательной среды. Качественный и количественный анализ проявлений инициативы в игре проведен с помощью инструмента для наблюдения, разработанного на основе методики Е.О. Смирновой. Всего проанализировано 14 видеозаписей совместной игры. Для диагностики творческого (диалектического) мышления были использованы методики «Что может быть одновременно», «Диалектические истории», «Три истории». Качественный анализ позволил выделить два типа инициативы — сохраняющую и изменяющую игру. Выявлена взаимосвязь между творческим мышлением в детских нарративах и инициативой, меняющей ход игры. Исследование указывает на ценность игры как деятельности, где ребенок может не только решать, но и ставить задачи.

Ключевые слова: дошкольный возраст; игра; инициатива; творческое мышление; диалектическое мышление.

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Introduction

The development of creative abilities of preschoolers is one of the most pressing problems in the research of age, its relevance is growing due to the increasing understanding of the importance of creativity for the full development and self-realization of the individual. Particular importance holds an understanding of creative thinking as being dialectical in its nature, which op-

erates with special logical structures — different from the formal-logical thinking and its operations, described by J. Piaget [5]. Dialectical cognitive actions are considered to be accessible to both adults and children and perform as a mechanism of solving contradictory situations and generating new ideas [2].

Researchers emphasize the meaning of play primarily as of a space of emotions and empathy [5; 16], this increases interest in considering it as a possible context for the development of creative thinking. This corresponds with the core methodological principle of cultural-historical psychology of the unity of affect and intellect: in play, a child solves not just cognitive problems, these tasks are always filled with meaning and loaded with emotions. The goal of this paper is to study the correlation between play and creative thinking in preschoolers.

The issue of the correlation between play and creativity was defined by the "great dialogue" between L.S. Vygotsky and J. Piaget. L.S. Vygotsky considered play as a space for the manifestation of creative imagination [4] and in his article "Play and Development" notes that play clearly reveals children's capabilities that are not yet visible in ordinary behavior [4, p. 226]. But in the work of J. Piaget play as a symbolic activity appears to be a space of assimilation and is opposed to intellectual adaptation and the formation of formal operations, Here, play acts as a way of egocentric satisfaction of needs (although in the long term it is important for achieving equlibrium) [5].

Over the past decades, a number of studies have been conducted on the connection between play and creative thinking: research of the relationship of play and divergent thinking [14], studying the role of play for the subsequent solution of divergent problems [21], formative research that question the influence of several play sessions on creativity [14; 17; 18], as well as longitudinal studies of the ability to play as a predictor of creativity in primary school [20; 23].

At the same time, the research results are ambiguous: although a connection between play and creativity is found in some studies, the developmental impact of play sessions on creativity haven't always been found significant.

A. Lillard [22] sees the reason for the inconsistency of data in the research design — short play sessions, small samples, etc. Another reason may be the diversity of the concepts of creativity and play used.

In this paper we understand the imaginary situation as the criterion for the play, and double subjectivity as its key feature [6; 13], and distinguish the play from the 'play event' (takes place in a 'play world') [16], because in the play world an imaginary situation is created by an adult, and the child can only partially influence it. The assumption is that play can become a space for the emergence of creative thinking because an important aspect of the creative process is intellectual initiative, which allows a person not only to solve assigned tasks, but also to set tasks for themselves independently [1].

The concept of creative thinking has been repeatedly criticized due to the lack of a definition of the thought process and its characteristics that leads to the creation of a new idea [1], and due to the irrelevance of the concept of creative thinking for such activities where, when putting forward a new idea, the child must take into account the positions of partners [8]. Here, by creative thinking we will understand the use of special dialectical structures, which are a universal mechanism for generating new ideas, accessible to adults and children. Dialectical structures understood as dialectical cognitive actions (such as transformation, mediation, change of alternative, etc.), which allow to productively operate with opposites and resolve contradictory situations [2]. On the one hand, the concept of dialectical thinking describes the creative process as structural,

leading to an insight, the resolution of conflict and a new understanding of the situation, and on the other — creative process described as divergent, generating many possible solutions.

The relevance of creativity as dialectical thinking is also confirmed by the fact that play itself has a dialectical structure, which is manifested in the intricacies of play substitution, the coordination of different ideas in a joint play, the duality of emotions, and the pleasure of acting along the line of greatest resistance [3].

In the context of searching for correlates of creative thinking in play, the phenomenon of children's initiative is important. In contrast to the study by N.V. Khazratova [8], conducted under the guidance of V.N. Druzhinin, where children's creative moves during play were diagnosed, we consider it important to make children's play initiative the subject of observation instead as a more observable phenomenon. Following E.O. Smirnova, we understand initiative in play as "the ability to act regardless of circumstances and to overcome them" [7, p. 14], and consider it to be a possible prerequisite for creativity. Important to note that children's supra-situational activity as a manifestation of creativity has so far been studied in problem solving, not in play [1].

Main hypothesis: there is a correlation between the initiative shown by older preschoolers in play and their creative (dialectical) thinking.

Additional hypothesis: in groups of older preschoolers with different quality of educational environment, children's manifestations of initiative in play will be different.

Methods

The sample consists of 57 preschool children (6—6.5 years old, 27 boys) from 2 Moscow schools. 2 groups with different levels of quality of the educational environment were selected: total scores, respectively, 2.21 and 3.68 (28 children from one group, 29 from the other). The difference in the quality of the educational environment was calculated using Student's t-test and was significant in terms of the overall score at the level of 0.004.

Observations of play were conducted in a playroom familiar to the children, where unstructured materials were available, and lasted no less than 50 minutes. The adult present provided only indirect support and did not join the play. Each child took part in two play sessions with a different composition of children (each group had 7—8 children). The children consented to filming. A total of 14 videos were made. Children's play was assessed using video recordings.

For evaluation of video recordings, a modification of the play observation parameters (substitution and interaction in the game) of E.O. Smirnova's was used [6]. It was also supplemented by the two-step play action [12]. Video recordings were simultaneously independently rated (not included in the study sample) by experts to test the reliability of the assessment tool. The parameters that manifested discrepancy between the estimates were corrected. After the second round of parallel assessment which used new video recordings, the experts' assessments completely coincided.

In order to diagnose creative (dialectical) thinking, following methods were used: "What can happen at the same time" (solving problematic/contradictory situations) [2], "Fairy tale stories", in which children are asked to solve a problem situation among fictional characters [10], and method "Three Stories", in which children supposed to create their own narrative — to compose a story about fire, a non-scary story about a scary character and a funny story) [11].

Assessment of the quality of the educational environment in groups using ECERS-3 scales [9]. The ECERS-3 scales measure the extent to which the educational environment (equipment, materials, interaction between teachers and children, time for free activities)

is focused on supporting children's initiative and takes into account children's interests and needs. according to ECERS-3 higher levels of quality imply greater opportunities for free activity in general and for play in particular. The assessment involves a 3-hour structured and non-participant observation by a certified expert in a group homeroom and on a walk in the morning.

Findings

The first stage of qualitative analysis — the initial viewing of videos — allowed to suggest that there are two types of initiative in the play: the first used to preserve the course of the play and second one used to change it. Preservation of the play expressed, for example, in suggesting a play idea that would help to continue the play without changing it (the story continues through cycles of repetitions, and new ways of playing do not appear). On the other hand, changing the course of the play would involve effort in both continuation (e.g. maintaining a connection with the original plot) and in causing change in the play: the play itself is the same, but new ideas and plot twists appear, and the possibilities for transforming emotions in the play expand. We suggest that it is the second type of initiative in the play that is associated with the level of development of creative thinking in preschoolers, since it allows one to simultaneously maintain and change the course of play.

After the initial analysis of the video recordings, the assessment parameters were corrected and supplemented with indicators (see table 1).

Analysis of the video using corrected parameters allowed to discover that children show both types of play initiative: play-saving initiative and play-changing initiative. During the play, the same child could make initiative actions of both types.

Table 1

Parameters for assessing initiative in children's play

Observation	Play-saving initiative (1 point for each appearance)	Play-changing initiative (2 points for each appearance)
The child suggests a challenge	The challenge in the logic of the plot is a provocation, but repetitive, extensive unfolding of the game	The challenge is new to the game — sets a new direction, preserves and changes the game at the same time
An answer to the challenge	An answer in the logic of the challenge, repetition of the answer	An answer to a challenge, changing the course of the play: • Adding new lines to the plot; • Changing the situation to the opposite; • Coordination and connection of conflicting ideas; • Resolving a real conflict between players through changing the plot
Subject substitution	One initiates the use of a copy toy or item for its intended purpose or initiates the use of a substitute item due to similarity	Invents and creates an object for the play, uses unusual substitutions when necessary to implement a play idea, solve or create a problem situation in the play
Play space	Initiates the functional use of space or creates playing places in the play following the logic of the original plot (changing quantity, but not quality)	Creates new play spaces, opposite in meaning to original ones
Play interaction	The proposed idea is accepted or rejected, meanwhile the joint play continues nonetheless	The child suggests linking two or more different ideas into one story

The maximum score obtained by a child during the two play sessions on the parameters "play-saving initiative" and "play-changing initiative" was used for statistical analysis. Scores were counted for each type of initiative separately.

Judging by manifestations of initiative, we identified three groups of children: 51% showed both types of initiative, 30.3% showed only initiative that preserved the play, 17.8% of children had no recorded manifestations of initiative in the play: last group either did not participate in the play or collaborated with other children. Significant differences were found (Two Sample Wilcoxon rank sum test) between groups with different quality of the educational environment, for both play-saving initiative (P-value=0.00191) and play-changing initiative (P-value=0.00127). In groups with a higher quality of education, children show initiative in play significantly more often than in groups with a lower quality.

Using one of the play sessions as an example, let's look at the differences between the two types of initiative. Playing girls act out the relationship between a horse and its owner and switch roles from time to time. For some time, role-playing actions follow the traditional algorithm: the owner harnesses the horse, feeds it, and prepares to ride it. The initiative that preserves the play lies in the children's proposals to feed the horse, ride it, arrange a place for it to spend the night ("Here's some hay, oats, eat it, little horse!", "Now I'm a horse, do the same with me", "Lure it with oats! Lure it with pancakes"). We qualified these actions as a manifestation of initiative, since one of the children proposed them, and the rest accepted them, and the play continued. Then, after a while, play-changing initiative happened: "Let me be a naughty horse". The "Naughty Horse" set a new vector for the play: it behaved in a fundamentally non-normative manner, upending the traditional role of the horse: it ran away, children had to look for it, catch it, etc. In this case, the child created a challenge for himself and for others, a test of loss and overcoming it. L.I. Elkoninova points out that creating a challenge situation is one of the options for a play initiative [12]. In this case, we see the "cognitive construction" of the challenge: the behavior of a "disobedient horse" — the transformation of a normative role into its opposite, its consistent negation.

Next, let's describe several cases of children's initiative that changed the direction of the play to see if it is possible to reconstruct the problem that the child was solving. In this case, the logic of analysis is opposite to traditional approaches in the study of creative thinking, where the child is presented with a task and his answer is analyzed according to the parameters of constructiveness or originality. In this case, it is impossible to detect such an important aspect of creativity as initiative, independent formulation of the problem, which is a basic characteristic of creativity [1]. Here we reconstructed the problem situations that children solved based on the analysis of children's initiative. We consider this approach to be more valid for studying children's creative thinking.

Let's look at two cases, "Mermaids" and "Monster". In each case, we will start from the manifestation of a child's initiative, which changed the course of the play. In the "Mermaid" case, as the play unfolded, the ship on which the children were sailing hit an iceberg, and it was clear that dramatic events were about to happen. But then one of the girls said a phrase that changed the course of the play: "We drowned, but suddenly it turned out that we were not dying, because we are mermaids and can live under water". An initiative here is also a solution to the problem: transforming all children from sailors into mermaids allowed the play to continue (over the next 40 minutes, all participants enthusiastically cre-

ated mermaid costumes and explored the underwater world).

In the Monster case, children fought with cardboard swords two against one. Composition of the pair changed all the time, children switched places, so all children at some point were in a role of a lone fighter. Those who had a partner at the time were quite happy, but when they found themselves alone children become upset. It continued for some time, until one of the boys, who, in turn, found himself without a partner, exclaimed: "I came up with an idea! Let's fight the monster!" and pointed to the carpet between the players. He suggested that instead of fighting with each other, they should switch to fighting with an imaginary character, thanks to which all the participants unite and no one is alone anymore. In this case, the task that the child solved was a task of uniting opposites and resolving a contradiction.

The described cases show that under the initiative action in the play the formulation and solution of a problem situation can be discovered.

Correlation analysis revealed significant relationship ($p<0.05$) between the frequency of children's initiative that changes the play, and the results of diagnosing creative thinking based on the material of narratives that were composed by the children themselves (the "Three Stories" method) ($r=0.27$ according to Spearman). No connection was found between creative thinking and play-saving initiative.

No significant correlations were found between the presence of play-changing initiative and the success of solving contradictory (dialectical) problems, which were proposed outside the situation where children create a symbolic context: in the methods "What can happen at the same time?" and "Dialectical Stories".

Discussion

The additional hypothesis of our study was confirmed by significant differences in the two preschool groups in terms of initiative in play (both play-saving and play-changing), which suggest that the quality of educational conditions, in particular, the nature of the teacher's interaction with children and the richness of the play environment, can act as one of the significant factors. However, this hypothesis requires further testing, since the nature of the manifestation of children's initiative could be influenced by other factors (for example, child's home educational environment, the socio-economic status of families, etc.), which were not analyzed in the framework of this study.

Correlations between the success of resolving conflicting situations and the presence of transformations and ambivalent characters in the narratives created by children were found only for play-changing initiative, which allows us to conclude that the distinction made between two types of initiative is legitimate and there are significant differences between types of initiative play actions, in particular, different cognitive mechanisms behind them.

Relationships between parameters that were found in this study partially confirm the main hypothesis and suggest that creative (dialectical) thinking can act as a cognitive mechanism for performing play-changing initiative.

A qualitative analysis of play-changing initiative also shows the possibility of discovering — as a source of the initiative action — a much needed solution to some problem that arises during the play, which confirms the hypothesis of E.O. Smirnova that "initiative is the most important prerequisite for creativity" [7].

Also of interest is the lack of significant correlations between children's play initiative (including play-changing) and the results of diagnosing dialectical thinking in the course of solving problems outside the symbolic context. It can be assumed that in symbolic space, where there is a diver-

gence between the real and semantic fields, problem solving occurs differently than in a conceptual or pre-conceptual context. This is consistent with the understanding of the importance of symbolic activity for the cognitive development of preschool children, which researchers point out, in particular, in studies on the role of conceptual play worlds, fantasy stories and symbolic reflection for cognitive development [15; 19].

The conducted research, establishing the interrelation between creative (dialectical) thinking in children's narratives and play-changing initiative, indicates the value of the play as an activity where the child can not only solve, but also set tasks (communicative, "challenging" tasks, etc.). Let us note that this multidimensionality and synthetic nature makes it difficult to analyze play: this is why a child's initiative often seems to be an unmotivated fantasy, and only reconstruction makes it possible to see the problem that the child posed and solved.

A relevant question in the context of growing interest in both children's play and creative thinking, which our research does not allow us to answer, but only to raise: is it possible to influence the development of creative (dialectical) thinking through the support of developed play, which creates space for the manifestation of children's initiative?

The data obtained in the study is another argument in favor of creating conditions for developed play, where there are opportunities to show initiative. It is this kind of play that is the "ninth wave of child development," according to the figurative expression of L.S. Vygotsky [4], and can become a space for the development of creative thinking.

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Metacognitive Reading Strategies: Analysis of Self-report Data and Oculomotor Behaviour of Russian Schoolchildren

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The paper presents the results of a study aimed to investigate the correlations between oculomotor reading behavior and self-report data of Russian high school students on their practice of using metacognitive strategies. It was found that high school students tended to use problem-solving reading strategies, while seldom using supportive reading strategies. Differences in the use of metacognitive strategies were found between schools that emphasized differently the development of reading competence in middle school. The findings suggested that there were differences in oculomotor measures across groups with varying levels of metacognitive strategy use. The paper outlines possible directions for further research on this topic.

Keywords: reading; digital reading; metacognitive reading strategies; metacognitive awareness; eye tracking; eye movements; adolescent readers.

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Метакогнитивные читательские стратегии: анализ данных самоотчета и глазодвигательного поведения российских школьников

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Приводятся результаты эксплораторного исследования, целью которого стало установление взаимосвязи между глазодвигательным поведением при чтении учебного текста с экрана монитора компьютера и данными самоотчета учащихся старших классов российских школ об их практике использования метакогнитивных стратегий. Установлено, что старшеклассники склонны использовать стратегии, направленные на решение проблем, возникающих при чтении, и в то же время редко прибегают к вспомогательным стратегиям, поддерживающим читательскую деятельность. Найдены различия по опросникам использования метакогнитивных стратегий между школами, в программе которых уделяется разное внимание формированию читательских компетенций в основной школе. Полученные результаты позволили авторам сделать предположение о различиях в глазодвигательных параметрах между группами с разными уровнями владения метакогнитивными стратегиями. Проведенный в исследовании анализ позволил авторам выделить вопросы, которые могут стать ориентиром дальнейшего направления исследований данной тематики.

Ключевые слова: чтение; цифровое чтение; метакогнитивные читательские стратегии; метакогнитивная осознанность; айтрекинг; движения глаз; читатели подросткового возраста.

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Introduction

Due to the ongoing digital transformation in education, electronic learning resources and digital texts have become an integral part of the educational process. An urgent scientific challenge is the study of cognitive and metacognitive processes that occur when reading from a computer screen, as well as the investigation of the relationship between these processes and educational outcomes.

One of the areas of research in digital reading is the analysis of reading strategies and patterns of reading behavior. In the theoretical framework of new literacy, reading multimodal hypertexts is seen as an independent process of constructing the text [11]. This involves the reader effectively and optimally building a path and method of interaction with the text. In order for such interaction to be successful, it is essential to use metacognitive reading strategies. These strategies help the reader become aware of their cognitive processing of the text and allow them to correct their work with the text. [7]. Such strategies are also known as consciously chosen actions that are aimed at achieving specific goals. These goals require conscious planning, monitoring, evaluation, and correction of the reading process [5].

Metacognitive skills and their significance for the educational process

Awareness of metacognitive reading strategies, the level of development of relevant skills, and their effective use are all related to high-level reading processes [23]. Awareness and regulation of thinking during reading are associated with effective reading comprehension. According to J. Flavella's concept, one of the first to define the nature and role of metacognition in reading, metacognition — "thinking about thinking" — includes a person's awareness of their thought processes and the active monitoring and regulation of their mental activity [15]. Using planning, monitoring, and evaluation strategies, students can become more aware of their cognitive processes and take appropriate actions to better understand the text. It has also been found to have a positive impact on reading memory. [16; 19].

In reading research, there are three main types of metacognitive strategies that are commonly used: global strategies, supportive strategies, and problem-solving strategies [26]. Global strategies include planning, regulating, and evaluating reading. This includes setting a reading goal, activating background knowledge, and checking whether the content of the text corresponds to your reading goal. Readers use problem-solving strategies when they encounter difficulties in understanding a text or when they need to optimize their reading process.These include, for example, adjusting the reading speed or focusing on reading more carefully. Auxiliary strategies, such as taking notes, highlighting text fragments, and using reference resources, are additional strategies that involve activities other than reading. A similar typology of metacognitive strategies has been used in questionnaires [28].

Qualitative studies on metacognitive reading strategies using verbal protocols have also supported the effectiveness of the proposed classification [3].

A representative body of research has been devoted to the role of metacognitive strategies in solving educational tasks.

It has been shown that students with a high level of metacognitive skill development are actively engaged in the reading process, utilizing effective strategies to enhance their understanding of what they read [27]. In addition, it is important to track your own current level of understanding of the text, for example, when working with scientific information to avoid problems with comprehension [29]. It has been shown that pedagogical interventions, during which metacognitive strategies are taught, change the patterns of eye movements that students use when reading text [25]. After the intervention, the students spent more time focusing on information relevant to the task and read it more often. The respondents were able to successfully locate the necessary text passages and focus on them, rather than reading the entire text superficially.

Metacognitive skills and eye-tracking reading behavior

In recent years, video oculography, or eye tracking, has been widely used in reading research as a primary method for collecting experimental data. This tool allows to collect objective data in real-time about the information processing process when working with text, such as the distribution of attention and the use of various reading strategies. Based on this data, it is possible to simulate reading processes for different categories of readers in different contexts [24; 29].

One of the areas of research in reading focuses on the strategies used to understand text materials in various formats. In this area, there is a great interest in the method and mechanism of how the pattern of eye movement is adapted to the task [13; 35]. It has previously been demonstrated in various languages that the type of text or reading task has a significant impact on oculomotor strategies, both for typical readers [1; 14; 33] and for those with reading and learning difficulties [10]. The task of reading the text thoroughly led to an increase in the amount of time spent on it, as well as an increase in the number of times people returned to previously read sections. The task requiring "familiarization" reading was performed by speed reading the entire text through longer saccades and shorter fixations and, at the same time, resulted in lower quality reading comprehension. Reading strategies, in which the reader is required to find errors, are expressed in shorter fixations and longer saccades, as well as fewer missed words. At the same time, reading comprehension was lower compared to the task for detailed reading. [33]. A study of reading patterns in scientific and educational comics has shown that increased attention to and selective rereading of key elements in text and illustrations leads to a better understanding of the material, as revealed by test results [20].

A small body of research has been conducted to analyze oculomotor behavior in relation to the use of metacognitive reading strategies. In the work of Tsai et al., it was demonstrated how the oculomotor behavior of strong and weak readers differed when using metacognitive reading strategies to resolve contradictions in a text. Students with a higher level of reading comprehension demonstrated a greater ability to navigate through the text and make connections between different parts that contained conflicting information, compared to students with less well-developed reading skills [34]. In addition, this study found small but significant correlations between self-reported use of critical reading strategies (implicit strategies) and visual behavior patterns (explicit strategies). This suggests that implicit and explicit reading strategies may work together to improve critical reading skills.

Despite the convincing evidence of the contribution of metacognitive strategies

to the results of semantic reading, there is currently a very limited number of studies examining the relationship between a reader's self-reported use of metacognitive strategies and their eye movements during reading. Most of the existing research on this topic is based on materials in foreign languages, while there is a lack of research in Russian. This study aimed to identify patterns in eye movement data when reading an educational text, and to compare these patterns with readers' self-reports on their use of metacognitive strategies. We formulated the following research questions:

1. How are the parameters of oculomotor activity during reading related to the subjective experience of using metacognitive strategies when reading educational materials?

2. Will the readers' reading strategies change depending on the task, and is it possible to track and measure these changes?

3. Are there any differences between schools that use different training programs in terms of how they assess cognitive skills or the patterns of eye movements students make when reading educational texts?

Organization and methods of research

The study consisted of two main stages: collecting data on the use of metacognitive strategies through a questionnaire and studying strategies for reading popular science texts using eye tracking to monitor oculomotor activity.

At the beginning of the study, the participants completed a questionnaire about their use of metacognitive reading strategies when reading digital texts. It was developed based on the Metacognitive Skills Assessment Methodology — Metacognitive Awareness of Reading Strategies Inventory (MARSI). [26]. Its content included a description of the actions and strategies that the respondent employs when reading educational or scientific materials. The questions are divided into three categories. The first category includes Global Strategies (GS), which generally characterize reading behaviour. For example, it includes planning reading actions and monitoring reading comprehension. Problem-solving strategies (PS) are used when difficulties or failures arise during reading. Supportive strategies (SS) differ from other reading strategies in that they involve additional activities that take place alongside reading, such as highlighting text fragments with different colours, accessing a dictionary to look up words, and taking notes. The questionnaire consists of 30 questions about the frequency of using certain strategies, with answer options ranging from "almost never" (1 point) to "almost always" (5 point). MARSI has been translated into Russian, and the wording of some questions has been adjusted. Five new questions have also been added, including questions about digital reading strategies, which were identified in a previous qualitative study [3]. herefore, the final questionnaire consisted of 35 questions. Each question was related to one of the different types of strategies. In addition, the questionnaire included questions about the type of study, gender, and age.

At the second stage of the experiment, participants were asked to read text from a computer screen and then answer questions about it. Before starting this part of the experiment, each participant was given a short training text to read that did not require answering any questions. This was done in order to allow the participant to become familiar with the structure of the text and the principles of the experiment. In the main part of the experiment, the participant was first presented with one of two tasks: analyzing the text or searching for information. No instructions were pro-

vided regarding the pace or strategy for reading and the sequence of actions. For the search reading task, participants were required to locate specific information within the text. Analytical reading requires an understanding of the general content and logic of the patterns presented. After completing the reading task, the participant was asked to read the text aloud and answer the questions by himself. The students had no time limits for reading and completing their assignments. After reading the text, the participants were presented with a series of questions with answer options that appeared in a pop-up window. These questions were displayed on the same page as the text. The student could easily return to the text and answer the questions as many times as needed. randomly assigned to one of two groups.

The popular science text "Kolchuga" has been chosen as an incentive material, referencing texts of a humanitarian nature and dedicated to the history of armaments in Russia. It was designed as an article for an online publication. That is, it included illustrations, was supplemented with hyperlinks, and was checked in accordance with the usual standards for an Internet page, such as font, indentation, breaking into short paragraphs, and pop-up hyperlink hints for target words.

The text consisted of ten paragraphs, each containing between two and four sentences. To maintain the ecological validity of the material, the text was designed to be long enough that the reader would need to scroll down the page to read it fully. The Flash Readability Index (FRE), adjusted for the Russian language by I.V. Oborneva, was 42 for the text, which is equivalent to the category of fairly difficult texts, similar to those found in high school textbooks [4]. The level of lexical complexity, calculated using the Textometer service, based on the percentage of words in the text that are included in the 5,000 most frequently used words in children's literature, is 7 out of 10. The level of structural complexity, based on the readability index of the Flash text with additional parameters, is also 8 out of 10 [2]. These scores indicate a high level of complexity in the text, which would likely correspond to an age group of 13—15 in terms of readability.

Each participant had a normal or adjusted vision. The parents of the participants and the participants themselves gave their informed consent to take part in the study. Oculomotor activity was recorded using the SR Research Eyelink 1000+ eye-tracker, with a sampling frequency of 500 Hz. Before the experiment, a 13-point calibration was performed. The stimulus materials were presented on a 23-inch monitor with a resolution of 1920 by 1080 pixels. All the study participants were approximately 760 millimeters from the screen. The width of the text is 949 pixels and the height of each letter is 26 pixels. During the recording, the respondent's head position was fixed using a forehead rest. The SR Research Web Link software was used to design and present the experimental task.

The study involved students from grades 9 to 11 from two schools in Moscow and the surrounding area. The data on the distribution of students by class and gender is presented in Table 1. Both schools are gymnasia, but School 1 is a private school that uses its own curriculum with a focus on the development of student's skills in the humanities. According to the testimonies of school management and teachers who were interviewed, special attention is given to the development of skills related to working with textual information and semantic reading in school education. School 2 is a public school that operates under a standard federal curriculum. During the conversation with the school administration and teachers, we found out that there is not a specific focus on the development of reading comprehension skills.

Table 1

The distribution of study participants by class and gender between schools, according to the survey data

	School 1	School 2
Grade		
9 grade	35	41
10 grade	28	28
11 grade	11	34
Sex		
boys	37	54
girls	37	49

Data analysis

Statistical data analysis was performed in the R [30] environment and the Statistica 10 software. To analyze the survey data, we used variance analysis, paired t-tests, and correlation analysis. The analysis of eye movements covered the period from the start of the text presentation on the screen until the first transition to a question. Subsequent returns to the text after reviewing the questions were not considered.

The lme4 package was used to create models for analyzing fixation data [8]. Unlike the analysis of variance, mixed linear models allow us to take into account not only fixed factors but also random ones, such as individual variability, which can influence the outcome of the variable [6]. In the context of studies on reading using the eye-tracking method, the data on fixation or reading of successive blocks of text from one individual are not completely independent. This limits the use of different variants of variance analysis. However, the use of mixed linear models can help explain a significant portion of the variability in the data [32].

The following variables were selected as fixed effects in this analysis: school (group), text assignment (task), class (grade), and their interactions. We also took into account the repeated measurements that were found in our data. The study participants (ID) and individual paragraphs of the text (IA_LABEL) were selected as random effects. The dependent variables were the number of fixations for a paragraph (fixation count), the average time of fixations for a paragraph (fixation duration), the time of reading a paragraph (dwell time), the number of transitions of the gaze to and from the paragraph (run count), the number of regression transitions of the gaze back to the paragraph (regression in count). Contrast matrices for fixed factors were used in all models (for more information about contrasts in linear models, see [31]). The logic of linear models involves comparing the effect of each independent variable with the conditional mean (intercept). This logic involves the assignment of rules, hereinafter referred to as the contrast matrix, according to which each independent variable will be introduced into the model. A rule is also defined that indicates what exactly will be considered the neutral mean value (intercept). For the variable “group”, the contrast matrix was compiled in such a way that the value of the school 1 falls into the intercept. A matrix of sum contrasts was applied for the variables “grade” and “task”. This was done in order to ensure that the intercept included the total average value for all levels of each independent variable, rather than some specific value. The P-values for the models were calculated using the lmerTest package [8], which employs the Satterthwaite approximation to estimate degrees of freedom.

Results

177 students completed the metacognitive skills questionnaire, with 74 students from School 1 and 103 students from School 2. The answers to the individual questions were grouped into three categories of strategies: global strategies (GS), problem-solving strategies (PS), and supportive strategies (SS). The Cronbach’s alpha coefficient was used to assess the reliability of the questionnaire. The result was 0.81, indicating a high level of reliability. The obtained coefficient indicates that the questionnaire has a high level of reliability.

Table 2

The average values for all subscales of the strategies tested in the questionnaire were calculated for two schools: global strategies (GS), problem-solving strategies (PS), and supportive strategies (SS). The values that differ significantly between schools are highlighted in bold

Strategies	School 1			School 2		
	The average value of the school (SD)	The average value of the grade (SD)		The average value of the school (SD)	The average value of the grade (SD)	
GS	**3,78 (0,45)**	9	3,75 (0,44)	**3,63 (0,48)**	9	3,57 (0,52)
		10	3,80 (0,43)		10	3,68 (0,45)
		11	3,90 (0,55)		11	3,65 (0,46)
PS	4,02 (0,56)	9	3,89 (0,41)	3,95 (0,54)	9	3,98 (0,56)
		10	4,01 (0,66)		10	4,05 (0,44)
		11	**4,47 (0,49)**		11	**3,86 (0,58)**
SS	3,00 (0,75)	9	2,75 (0,60)	2,98 (0,63)	9	3,02 (0,61)
		10	3,17 (0,74)		10	2,97 (0,67)
		11	3,38 (0,97)		11	2,92 (0,62)
All strategies	3,57 (0,47)	9	3,43 (0,39)	3,48 (0,42)	9	3,48 (0,45)
		10	3,63 (0,49)		10	3,52 (0,45)
		11	**3,85 (0,56)**		11	**3,44 (0,38)**

The level of application of reading strategies in solving problems was higher than that of global reading strategies and reading support strategies, as shown in Table 2. The correlation analysis revealed that the indicators from all the subscales were positively correlated with one another (GS-PS: r=0,52; GS-SS: r=0,38; PS-SS: r=0,47, p<0,001 for all correlations).

Significant differences between schools were observed only in the subscale for global strategies (GS) (t-тест, p<0,05). Two-factor analysis of variance also showed that the school factor had an influence on the GS scale, but there was no significant influence from the grade factor. For schools of PS and SS, an interaction of factors was identified: in school 1, there was an increase in scores from ninth to eleventh grade, while in school 2, there were no significant differences between grades (for PS F(171,2)=5,333 p=0,006; for SS F(171,2)=4,035, p=0,02). At the same time, the scores for SS and PS in the ninth grade were similar for both schools. In the subsequent pairwise comparisons of schools, for each class separately, only the results from the SS (t-test, p<0.01) and the average scores for all assessment strategies (t-test, p<0.01) were significant (see Table 2).

Despite the differences in the average scores for strategies, when it comes to individual questions, the average responses from both schools correlated with a coefficient of r=0.95 (p<0.001). The highest and lowest points in the questionnaire for each school were also very similar. The most rarely used (less than 3 points in both schools) were four SS and one PS, and the most frequently used (more than 4.1 points in both schools) were three GS and two SS.

Of the participants who completed the questionnaire, 141 individuals passed the second stage involving the recording of eye movements. Data filtering was performed for the analysis. Low-quality records were excluded, as were records of experiments in which the student answered questions

without reading the entire text. This resulted in 122 records being included in the analysis, with 52 from School 1 and 70 from School 2. Paragraphs of the text have been identified as areas of interest.

The intercept of the model for the "fixation duration" parameter was β=232.0419, SE=3.0203. The duration of fixations for school 2 was significantly shorter compared to the intercept of the model (β=–8.04, SE=3.02, 95% CI [–15.39, –0.70], t-value=—2.15, p=0.032). The intercept of the model for the "number of fixations" was β=49.32, SE=3.73. It was found that the number of fixations was significantly higher for school 2 compared with intercept (β=8.3, SE=2.79, 95% CI [2.83, 13.79], t-value=2.97, p<0.01).

For the parameters "paragraph reading time" and "regression movements from the paragraph", no significant influences of the factors "school" (p>0.05), "grade" (p>0.05) and "task" (p>0.05) were recorded in the model. The intercept of the model for the parameter "number of regressions per paragraph" was β=0.44, SE=0.08. A statistically significantly higher number of returns to the previously viewed zone were made in school 2 (β=0.19, SE=0.05, 95% CI [0.10, 0.29], t-value=4.005, p<0.0001), and the difference was ensured by more frequent returns to the first half of the text (see figure 1). The intercept of the model for the parameter "number of occurrences of a glance to a paragraph" was β=2.31, SE=0.13. A significantly higher number of transitions were also made in school 2 in comparison with the intercept (β=0.63, SE=0.14, 95% CI [0.36, 0.91], t-value=4.52, p<0.0001), the difference was stable for all paragraphs. For all the above parameters in the model used, the factors "grade" (p>0.05) and "task" (p>0.05) did not have significant effects.

For the parameters "paragraph reading time" and "regression movements from the paragraph", no significant effects of the factors "school", "grade", and "task" were recorded in the models (p>0.05).

A pairwise comparison of the basic reading indicators averaged for all paragraphs was carried out, first at the school level as a whole, then between grades 9, 10 and 11 of the two schools separately. The average data for all oculomotor parameters in groups with deviations were given in Table 3.

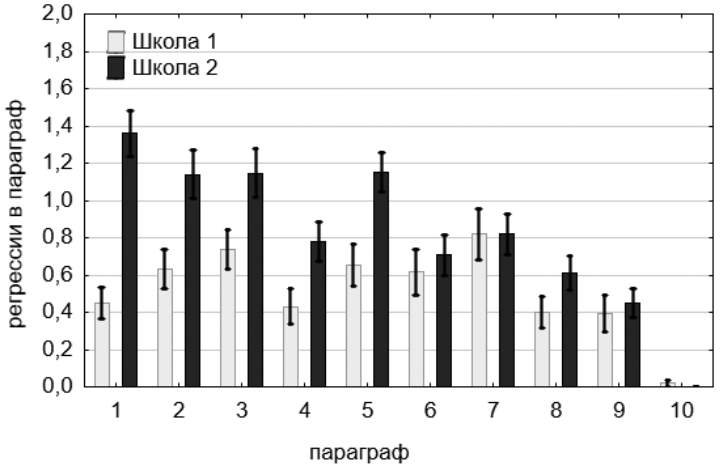

Fig. 1. The number of times participants' eyes returned to each paragraph of the text, averaged across the two groups of participants, is given below. The standard error of this average value is also provided

Table 3

The average values with a standard deviation for the parameters of oculomotor activity in individual paragraphs. Values significantly different between schools are highlighted in bold when compared in pairs (t-test, * — p<0.005; * — p<0.001)**

	School 1			School 2		
	The average value of the school (SD)	The average value of the grade (SD)		The average value of the school (SD)	The average value of the grade (SD)	
The time of reading the paragraph, sec.	12,7 (3,98)	9	13,47 (4,22)	13,78 (4,22)	9	13,71 (5,08)
		10	12,57 (3,8)		10	13,61 (4,59)
		11	11,41 (4,12)		11	13,96 (2,99)
The number of regressions to the paragraph from the subsequent text (Regressions in)	**0,63 (0,6) *** **	9	**0,59 (0,27) *** **	**0,96 (0,49)*** **	9	**1,01 (0,48) *** **
		10	0,54 (0,38)		10	0,79 (0,45)
		11	0,99 (1,34)		11	1,03 (0,51)
The number of occurrences of the view to the paragraph (Run count)	**2,5 (0,92) *** **	9	**2,48 (0,66) *** **	**3,32 (1,05) *** **	9	**3,43 (1,05) *** **
		10	2,39 (0,78)		10	2,94 (0,9)
		11	2,89 (1,63)		11	3,47 (1,11)
The number of fixations per paragraph (Fixation count)	**52,03 (14,98) ***	9	54 (15,28)	**59,22 (15,92) ***	9	58,32 (18,98)
		10	**51,67 (14,59*)**		10	**60,25 (16,74) ***
		11	48,79 (16,88)		11	59,42 (12,12)
Duration of fixation, ms (Fixation duration)	233,42 (15,29)	9	236,94 (16,75)	223,98 (22,29)	9	224,22 (19,16)
		10	233,52 (15,37)		10	215,9 (21,2)
		11	225,2 (8,28)		11	229,34 (24,93)

An analysis of the relationship between eye movement patterns during reading and self-reported metacognitive strategies was conducted. The correlation analysis did not reveal significant relationships between the average scores on the three main metacognitive reading strategies and parameters such as the number of fixations, average fixation duration, average time to read paragraphs, or the ratio of time to read the last sentence in a paragraph to the first sentence (finishing time). However, correlations between oculomotor activity metrics and performance on individual tasks were found. The most significant correlations were between the evaluation of a strategy ("I read more carefully those parts of the text that are underlined, in italics, or in bold") and the average number of returns to the previous paragraph in the text (r=0.28, p=0.002). There were also correlations between the number of returns from the previous paragraph to the top of the page (r=0.19, p=0.037) and the number of times the user looked at the paragraph (r=0.27, p=0.003). The value of the average duration of fixations was correlated with the scores for several questions, most significantly with the statement "When reading online, I read slowly and carefully to make sure I understand everything correctly" (r=–0.23; p=0.008). It was also correlated with the statements: "When I read new information, I often relate it to what I already know about the topic" (r=0.20; p=0.031), "I can distinguish facts from opinions during reading" (r=0.21; p=0.022), "To remember information, I print out texts and underline or highlight important information" (r=–0.20; p=0.027), and "To mark key information, I highlight text fragments or leave comments" (r=–0.21; p=0.020). There was also a positive correlation between the scores for the

strategy “reading more carefully those parts of the text that are framed or colored” and the average number of times a person glanced at a paragraph (r=0.19, p=0.032).

Discussion

In this study, we evaluated the use of metacognitive reading strategies using the results from a survey, as well as the impact of pre-text tasks on oculomotor patterns when reading texts.

The obtained Cronbach’s alpha coefficient of 0.81 indicates a high level of reliability for the questionnaire used in this study. This confirms the clarity of the questions and their uniformity, which is essential for the accuracy and reliability of the research.

In general, the average results from both schools show similar patterns of strategy usage. According to self-reported data, high school students most often use strategies to solve problems. This is natural, as a reading difficulty, associated with, for example, a misunderstanding of the text, is a significant event that should be addressed by using one or more strategies. The least used strategies are those related to modifying digital text or supplementing reading with additional activities: reading aloud, taking notes, and printing text.It is possible that this is due to a lack of understanding among schoolchildren of the significance of these strategies for effective reading. Another possible reason could be the lack of training in schoolchildren in reading techniques such as taking notes and reading with notes. Finally, the implementation of supportive strategies requires additional resources and organizational conditions (such as the ability to print text), which may not always be available.

The results of the study indicated that the use of global strategies was not common among the respondents who were surveyed. Global strategies include targeted actions such as planning the reader’s route, determining the reading speed, and deciding on the type of reading material.It has been established that the active implementation of global strategies is essential for successful education at high school, and students who achieve high academic results report on their active involvement [3]. In this study, the most popular global strategy was found to be the one that relies on context to understand the text. At the same time, it has been revealed that schoolchildren do not tend to preview the text before reading (i.e., use an introductory reading strategy) or focus on individual fragments of the text that are relevant to completing reading tasks (i.e., employ search or selective reading strategies). This indicates the prevalence of linear sequential reading among high school students, which the school has been preparing for since the first grades. Meanwhile, effective reading to solve a specific task often requires a non-linear approach to the text, including browsing, selective reading, and search reading.

In grade 9, the average performance of students in all groups using different strategies does not differ significantly between schools. In school 1, there is an increase in self-esteem in the use of all strategies from grades 9 to 10 and 11. In contrast, there has not been any significant change in school 2. The reason for these differences may be due to the differences in the educational programs offered by the schools. According to teachers and the school administration, school 1 places a special emphasis on the development of reading literacy and reading independence during high school.

An analysis of eye movement activity revealed a significant difference between the two schools. The average reading time for the paragraphs was not significantly different, but the students from the two schools had slightly different reading patterns. The students of school 2 had

shorter but more frequent fixations when reading, while this group made more regression movements through the text and had a lower total number of paragraphs read compared to students from school 1. Such specific reading patterns, especially returning to read paragraphs, may be due to the use of a re-reading strategy for better comprehension [9; 28]. The study participants were aware that they could revisit any part of the text at any time and took advantage of this feature, which correlates with one of the metacognitive strategies described in the literature. However, according to the survey results, this strategy was not mentioned as a frequent one by the respondents. On the other hand, previous studies have shown that when working memory is heavily loaded, readers prefer to rely on repetitive searching in the text [12]. Therefore, students from school 2 may have revisited previously read paragraphs before moving on to questions, in order to refresh previously read information in their working memory.

Previous studies have shown that students who use critical reading strategies more often make more connections between paragraphs [34]. We expected to see a similar trend among school 1 students who score high on one of the criteria for the global strategy, which involves using context to better understand a text. However, our results showed a different pattern: the students from school 1 made fewer paragraph transitions compared to the students from school 2. Perhaps the material was easy for students from school 1 to understand and did not require a specific strategy for critically assessing the context or better understanding. The reading pattern, as indicated by longer fixations on words and fewer returns, in students at school 1 may suggest that they initially read the text with more care. This may be due to the school's emphasis on in-depth work with written material. It should be noted that reading in school 2 was not selective. Students rather used a strategy of rapid and relatively superficial reading, rereading all or most of the text. This is indicated by the relatively more frequent returns to the first half of the text and the consistently higher number of readings of all paragraphs. Based on the results of studies on attention and the influence of prior knowledge and individual reading strategies on eye movement patterns [17; 18; 21; 22], we can allow students in school 1 to better memorize and assimilate the material during their first reading without the need to return to previously read parts of the text before moving on to questions. However, in this study, an estimate of the amount of working memory among readers was not made, which limits our ability to fully rely on this interpretation. Further research should include measurements of the working memory capacity of readers in order to better understand the findings.

As can be seen from Table 3, there were differences between classes in both schools, but these differences were not systematic or unidirectional. As can be seen in Table 3, there were some differences between classes in both schools, but these differences were not systematic or unidirectional. The absence of a significant grade effect on the "fixation duration" parameter in School 1 is likely due to the wide range of individual variation in this parameter within the studied group. It can be noted that there were significant differences between schools in terms of the number of times students regressed and re-read text, with the most pronounced differences in grade 9. However, older classes also made use of re-reading.

Within the scope of this study, there was no significant effect of the task factor on reading performance, according to the average data presented in Table 3. Previously, it has been shown in studies that different tasks alter the reading pattern, as evidenced by

oculomotor characteristics [33]. The lack of significant impact on our data may be due to the lack of proficiency in the use of metacognitive strategies among school students and their limited application in the eyetracking experiment. This may prevent them from fully adapting their reading patterns to the task at hand. The habit of reading more thoroughly at school 1 and reading quickly with frequent re-reads at school 2 may explain the lack of significant differences in reading performance when completing different tasks. Additionally, another factor could be the absence of time pressure: students had no motivation to use a riskier strategy of rapid skimming in the case of information retrieval.

The lack of clear and unambiguous connections between the data on self-assessment of metacognitive strategy use and eye movement patterns among strategy groups is expected, as each group is quite diverse and should not display clear patterns in oculomotor activity. Many strategies relate to processes such as preparing for or working with text, which may not be reflected in an eye-tracking experiment. Of interest are the significant correlations found between the parameters of rereading the text andan assessment by one of the schools related to working with the paragraph "I read more carefully those fragments of text that are underlined, written in italics or bold". The text selection was not used in the experiment, but both the question and the metric for re-reading the text reflect the elaboration of information. At the same time, the estimates on the question about re-reading, which were included in the questionnaire, did not show any connection with the real re-reading metrics. An inverse correlation was found between the average duration of fixations and the score for the item "I read online slowly and thoughtfully to ensure I understand everything correctly". Although slower and more thoughtful reading is expected to increase cognitive load, this should also be accompanied by a longer fixation duration [28]. In general, a lack of a clear and consistent relationship between self-reported use of metacognitive strategies and actual metrics of eye movement behaviour during reading may indicate a gap between a person's perception of their metacognitive abilities and their actual use of these strategies.

Conclusion

The aim of our study was to investigate the metacognitive strategies used by high school students while reading from a computer screen, the variability in their reading patterns based on the task, and the possible relationship between eye movement patterns and self-reported strategies, as well as to analyze the consistency of these patterns across grades 9 to 11 in two schools.

Differences were found in the use of metacognitive strategies among schools that focus on different aspects of reading competence. The main differences were related to the use of global reading strategies. At the same time, students in both schools often use strategies to solve problems.

The data collected on oculomotor activity suggests that there are more shorter fixations on individual paragraphs in school 2, and a higher number of transitions between paragraphs. used by some students, where they quickly and superficially read a text the first time, with the opportunity to revisit previously read parts an unlimited number of times. No significant effect of the class level on oculomotor activity has been found, however, there seems to be a tendency for oculomotor characteristics to change from 9th to 11th grade at school 1. The study also found no significant impact of the task on eye movement parameters. The lack of task effect may be due to students' insufficient use of metacognitive strategies, which prevents them from adapting their reading pattern to the task. Additionally, students may use the most familiar reading strategy, regardless of the task, in the

absence of any incentives to change their approach.

It was not possible to establish a clear connection between the data from the questionnaire about the use of metacognitive strategies and the patterns of eye movements while reading. This may indicate a difference between how people perceive their own use of metacognitive strategies and how they actually use them.

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Online Reading Comprehension Assessment of Primary School Students: Analysis of Testing Behavior Indicators

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Test-taking behavior in reading comprehension tests is explained, among other things, by meta-cognitive skills, which can be described by indicators of test behavior. These indicators include reading time, respondent-item interaction time, returning to the text, etc. This study is based on the analysis of the test-taking behavior of fourth graders (N=2168) during a reading comprehension test. Two types of indicators of test behavior were described: 1) timing and action speed control; and 2) nonlinear test navigation from item to item and returns to the text. Based on these indicators and using cluster analysis, we identified groups of students with typical patterns of behavior. These groups were described in the context of student gender and test score in the test. The results showed that the data about nonlinear transitions helps to find out the groups of students with regulatory difficulties, however the presence or absence of nonlinear transitions is not associated with test results. Higher results of students are associated with taking test in a linear pattern and a moderately long time.

Keywords: reading comprehension tests; reading assessment; test-taking behavior; metacognitive skills; reading strategies; test strategies.

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Цифровое тестирование смыслового чтения обучающихся начальной школы: анализ индикаторов поведения

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Представлены результаты исследования, посвященного поиску поведенческих индикаторов, которые могут говорить о результатах применения учениками их метакогнитивных умений во время выполнения теста читательской грамотности. Отмечается, что для этого были разработаны индикаторы тестового поведения, рассчитанные на данных о тайминге и операциях во время прохождения теста. К таким индикаторам относятся: время чтения, время взаимодействия с заданиями, умение вернуться к тексту и заданиям для проверки информации и т.п. На основе анализа поведения 2168 четвероклассников во время выполнения теста смыслового чтения были проанализированы два типа индикаторов тестового поведения, которые могут говорить о степени сформированности метакогнитивных умений: контроль скорости и равномерности деятельности в процессе прохождения теста и вариативность передвижения по тесту (наличие нелинейных переходов по заданиям и возвратов к стимульному тексту). С помощью применяемых индикаторов и кластерного анализа были выделены группы учащихся с типичными паттернами поведения, которые были описаны с привлечением информации о поле обучающегося и его балле за тест. Результаты показали, что наличие нелинейных переходов по тесту позволяет выделить группы обучающихся с трудностями регулятивного характера, однако наличие или отсутствие нелинейных переходов по тесту не связано с тестовыми результатами или с полом респондентов. Более высокие результаты обучающихся связаны с равномерным прохождением теста и умеренно большим временем чтения.

Ключевые слова: тесты смыслового чтения; оценивание читательских умений; тестовое поведение; метакогнитивные умения; читательские стратегии; тестовые стратегии.

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Introduction

Reading comprehension is a better predictor of future academic efficiency [25; 35]. In the field of actual research of reading as a basic meta-subject construct, the problem of accurate assessment of reader's literacy and objective interpretation of the results has become even more relevant [2].

The fact that reading directly includes reading and strategic competence explained the complexity of the considered construct. Strategic competence means the respondent's ability to carry out a perspective and situational reflection of their reading activities and to adapt interaction with the test to improve the result [39].

It is necessary to describe the terminology. There is a school in Russian assessment practice, where the term "test" is applied only to assessment tools consisting of closed-type tasks (with a choice of one or more correct answers) [9]. However, according to international practice, we will use this term as an "assessment tool" (EFPA), thus, the test may contain both closed-type and open-type tasks with a open-ended answer [21].

Thus, test behavior is the set of the respondent's interactions with tasks with different characteristics during the test. At the same time, the respondent's actions may be conscious, arbitrary, or spontaneous, not based on planning and control.

We name typical patterns of actions during test behavior as test strategies [15]. Conscious, thoughtful, based on regulatory skills and reflection, test strategies are a demonstration of metacognitive skills, the development of which is an actual problem for the the regulatory and motivational sphere of students.

The relevance to the current study is explained by the fact that the priority of the didactic paradigm of student subjectivity attracted attention to the investigation and taking into account the individual characteristics of students. The proposed solution is based on the use of a process-oriented approach, in which all the respondents' operations are analyzed in the context of their timing, as well as presented a scheme of reader activity management, which allow to draw conclusions about the conditions that provide or limit reading skills.

The aim of the study is to expand the didactic possibilities of reading tests and provide all members of the assessment process information not only about test results, but also how it was obtained.

Theoretically, the alteration of the test behavior during the test is explained by various factors. Thus, the theory of value and expectations (value expectation theory) describes the relationship between the respondent's perception of a test situation and his action via predicting the probability of success and subjective significance in the case of a correct decision, as well as through assessing the necessary "costs" and expected difficulties [18; 19]. Thus, theoretically, two factors are associated with the respondent's behavior: 1) his conviction of his own "objective" readiness to solve this task with these characteristics; 2) his ideas about the importance of solving this educational task.

The first factor, in turn, consists of: 1) a subjective assessment of the task characteristics 2) an assessment of one's own readiness in relation to the task. For example, the fact that a respondent skips a task with a volume text may indicate that it seemed too difficult. A rapid guessing behavior in a difficult tasks and simultaneously its absence in relatively easy tasks is the mark of low assessment of one's own readiness (here "difficult" is not meant to be a real difficulty, but perceived complexity, abstraction, a large number of stages, etc.).

The second factor (the inner understanding of the importance of the task) consists of: 1) emotional attitude to the result (close to internal motivation) 2) perception of the "usefulness

of the result" for the near future (close to external motivation) 3) "importance of the result" (for example, whether the respondent's success in this task brings him closer to the image of the student he represents himself to) and 4) estimates of the amount of resources required to solve this task (including time, among others) [18; 27].

The variability of students' interaction with the test tasks is explained on the basis of the concept of language competence by Bachman and Palmer [11, p. 62]. This concept is based on the fact that the use of speech is conditioned by the interaction of the respondent's strategic competence and the test situation. The complexity of this interaction includes: 1) direct language knowledge, 2) background knowledge, 3) individual characteristics and affective mechanisms that are responsible for evaluating the test situation. In previous studies, it has been shown that the perceived difficulty of the task by the student is related to its format, the presence of difficult vocabulary in the text, the correlation of the task with cognitive operations, the correlation with the length of the passage to which the reading task belongs, and other factors [2; 3].

It is important to note that in addition to strategies based on the use of academic and metacognitive skills (will be described below), there are also "wise-behavior strategies": These are attempts to use background knowledge where it is not provided for by the task as an attempt to guess the answer [15].

The requirement for the development of universal educational actions (UMS) is described in the Federal State Educational Standard of Secondary Education and Federal State Educational Standard of Primary Education. In the scientific foreign literature, the closest analogue of the regulatory component is metacognitive skills. The developed regulatory skills of students mean the monitoring and evaluating educational activities, the ability to identify their own difficulties and their causes, convey intellectual reflection, etc. Metacognitive activity is exactly the "tracking by students of the process and results of their own cognitive activity in solving learning tasks" [6].

Initially, the term "metacognitive skills" was described as "the process of careful, conscious thinking, when each action requires prior planning and subsequent evaluation; where decisions and operations are both weighty and risky" [22]. After many years of research, the term is also used to for the reflection of the process and managing this process [40]. In the context of comprehension of reading tests, it is a conscious activity of controlling of the reading comprehension and conscious solving the test [16]. Metacognitive skills are the "core of strategic competence" because they help to identify the inefficiency of a student's activity and activate the arbitrary application of effective strategies.[11].

Metacognitive skills are important during passing tests — using a variety of strategies, students exclude incorrect options, look for clues in the wording of questions, and return to correct answers [24]. The variability of metacognitive strategies provides a variety of interactions with test tasks of different formats (for example, working with text, drawings, graphs) [20]. Moreover, where more attention is paid to the metacognitive development of students, where special practices are implemented, students use various reflexive practices during interaction with educational tasks for their effective solution [28].

In the context of reading, the connection of metacognitive skills with reading comprehension has been proven [13; 14; 30; 34; 43]. Readers with a high level of understanding use various reading strategies in situations where their metacognitive skills allow them to identify a lack of understanding actively and arbitrarily [44], mediate the influence of motivational factors on subject abilities [38].

As for primary student, there is an assumption that control over cognitive skills appears at the age of 8-10 years and is associated with the ability to make decisions in a unusual situation. This ability certainly increases the level of functional literacy of schoolchildren [10]. Other studies also confirm that increased awareness of metacognitive strategies expands with age [12].

The procedural component is specific to the considered construct [41]. Some studies

of the procedural component in reading were based on the fixation of eye movements, and it was exactly timing that became a key indicator [38]. The eye movement fixation approach has limitations like it demands sophisticated equipment, small samples and the ambiguity of the conclusions due to noisy data. Another approach, more suitable for big samples based on timing of operations, is fixing the time of interaction with a fragment of text in which the researchers specifically laid inconsistencies, or fixing the time of interaction with the question after reading the text [41].

Readers with a high level of comprehension are more likely to reread complex fragments of text [42]. Re-reading is one of the actions that is associated with metacognitive skills, because the awareness of misunderstanding leads to the adaptation of reading process, implementation of another actions and is aimed to improving the effectiveness of the whole activity. There is ambiguity in researchers' use of the term "cognitive skills" (or "cognitive strategies"). They are understood as actions used by readers in reading literacy tests to compensate a lack of understanding or overcome difficulties in understanding, for example, identifying meaningful information, searching for connections between text fragments, highlighting summarizing sentences, rereading and searching for details, etc. The ambiguity lies in the fact that the same behavioral indicators (for example, rereading) are evidence of both the "cognitive ability" to make oneself to return to a difficult fragment, and the metacognitive ability to notice a lack of understanding. Theoretically, cognitive skills are a manifestation of developed metacognitive skills — these are the actions that respondents take to implement a "metacognitive" plan [11]. But in the assessment practice, it is impossible or very difficult to find indicators that would be strictly related only to metacognitive, or only to cognitive skills.

Thus, a review of the literature showed that the factors of variability of test behavior are the characteristics of the respondent, the characteristics of the tasks and their interaction.

The organization of the study, the applied methods and hypotheses

The task of our study was to analyze the "digital traces" (timing, transitions on the test) of students during online test of reading comprehension aimed at identification informative indicators of the individual characteristics of the test behavior while interacting with tasks and with the stimulus material of the test.

Sample: the study was conducted in the spring 2022, there were 2,187 4th grade students from schools in the Siberian city of one million recruited for this study. After deleting the profiles of respondents who missed 5 or more tasks, 2,168 observations were included in the final analysis. Another 15 respondents had from 1 to 4 missed assignments at the end of the test (it can be interpreted as that they did not have enough time), they were used in the analysis.

Assessment tool: We used the "Progress" assessment tool , developed at the Center for Psychometrics and Measurements in Education at the HSE Institute of Education [1]. We used a specially designed literary text with 23 questions to assess participants' reading comprehension. The psychometric analysis of the test was carried out via the model of the modern theory of testing Partial credit model, which belongs to the family of Rush models, in the Winsteps software [26; 29]. The test showed significant one-dimensionality: The eigenvalue of the first contrast in the analysis of residues was 1.5, which is less than the conventional criterion of 2.0 [36]. The reliability of the Person reliability test was 0.78/0.81 (real/model), which allows us to identify three groups of respondents differing in level of ability. The reliability of Cronbach's alpha was 0.8, which indicates a high internal consistency of tasks. All the tasks of the test are in agreement with the model — moderate mean-square statistics of the agreement of all tasks are less than the conventional criterion of 1.3 [26]. Tasks have a difficulty range from -2.32 logits to 2.13 logits, which allows us to evaluate respondents with low, medium and high results. The distribution of respondents' responses is similar to normal.

Assessment: The operation with the text and questions was limited to 40 minutes. The digital assessment took place in computer classrooms of schools. The students' activities during the tests were completely autonomous. Respondents had the opportunity to skip tasks without entering an answer or scroll through the text, return to any stage, and correct answers.

Research hypotheses:

1. Indicators of test behavior (uniformity indicators of interactions with tasks, indicators of linearity of completing test tasks, and returns to reading text) allow you to identify groups of students with similar patterns of test behavior.

2. Patterns of test behavior are related to students' subject (reading) results.

The process of identifying typical patterns

To identify typical patterns, we used two groups of indicators that are easy to access in the tool's logbook.

Linearity indicators

This is data about returns to the text and tasks. We call linear passing of the test sequential (without returns, omissions) passing of the test with a single reference to the text and subsequent tasks. Non-linear passing of the test is an arbitrary skipping of tasks, inconsistent transition through tasks (transition from the first task to the fifth, etc.), returns to previous tasks, as well as returns to the text.

Non-linearity in passing the test may indicate the use of metacognitive skills (for example, to assess the amount of work ahead before starting the test, skip too difficult tasks to return to them later, or return to the text to clarify what you read).

For the purposes of analysis, from the variable describing the number of returns to the text, we have identified three dummy variables encoded 1/0 (1 — the respondent refers to this variable, 0 — does not relate to this variable): 1) zero returns to the text (1,469 respondents); 2) 1 return to the text (373 respondents); 3) 2 or more returns to the text (329 respondents).

Based on the variable describing the number of returns to tasks, three dummy variables were also used, encoded 1/0: 1) the number of non-linear transitions for tasks is 0 (825 people); 2) the number of non-linear transitions for tasks is 1—5 (952 people); 3) the number of non-linear tra sitions for tasks is 6 or more (394 people). The choice of data simplification criteria was determined by the goals of achieving group contrast.

Indicators of uniformity.

We assumed that both absolute and relative time indicators would be important characteristics of respondents' behavior. The tool was designed in such a way that reading the text did not take more than a third of the time allotted for the entire test. This was proved during cognitive labs. We also assumed that in the process of working on the test, the difficulty of the tasks and the significance of the educational task of the test may vary depending on the fatigue and situational motivation of the test participants. It was the dynamism of engagement that dictated the necessity of using three time variables in the analysis: 1) the time (duration) of reading the text (stimulus material); 2) the time of passing the first half of the test tasks (this is the stage of introduction with the format of tasks, assessment and adaptation to the difficulty of tasks, to the test situation, to an autonomous format of operation); 3) the time of passing the second half of the test tasks (in the second half of the test there was more tasks for higher levels of cognitive skills: searching for information that is not explicitly given, analysis and synthesis). Of course, the test questions may not be the same in terms of estimated execution time, but in general, the first and second half of the test should be balanced in terms of execution time. One task, which was an open type task and could require significantly more time, was excluded from the analysis. Thus, the first and second half of the test consisted of 11 closed-ended questions.

If the first three variables from this group of indicators describe the absolute working time of students at the "beginning, middle and end of the test", then the next two indicators characterize the dynamics of the duration of interaction with tasks. Since there are no standards for the time of interaction with the tasks in reading tests, we used to analyze the duration of interaction with tasks relative to the average value for the sample.

We allocate a very fast task execution time relative to the entire sample (for convenience, called "fast bursts") and a very long interaction time with test tasks ("slow bursts"). If the student's task completion time is less than –1 standard deviation of time across the entire sample, then this is a "quick spike". If the student's task completion time is greater than +1 standard deviation of time across the entire sample, then this is a "slow spike" — the task was completed for a very long time.

"Fast" and "slow" bursts were analyzed separately for the first and second half of the test.

Table 1 describes the variables of the uniformity of the test: the time of interaction with the text, the first half of the tasks and the second half of the tasks, and the number of "fast" and "slow" bursts in the first and second halves of the tasks.

A hierarchical cluster analysis was carried out to identify test strategies [31]. The advantages of this method is the stability of the results. The analysis took place in two stages: working with a group of linearity indicators and working with a group of uniformity indicators. Linearity indicators included dichotomous variables, so a binary distance was used to calculate the distances between observations, which is calculated as the proportion of elements that are common to two variables. The Euclidean metric was used to calculate the distances between observations of the second group of uniformity indicators. The Ward method, which allows the allocation of clusters in such a way as to minimize intra-group variance, was used as an agglomeration method.

Differences in average test scores between groups were checked using the Kruskal-Wallis criterion, and pairwise differences were checked using the Wilcoxon signed-rank criterion with Bonferroni correction for multiple comparisons. The decision to use nonparametric methods was based on the fact that the requirements for using single-factor analysis of variance were not strictly met. The equality of the distribution of students by gender in clusters was checked using a two-proportional z-test.

Previously, all quantitative variables included in the analysis were standardized with an average of 0 and a standard deviation of 1.

The analysis was performed using the stats package (version 4.2.2) and rstatix (version 0.7.2.) in the R programming environment (version 4.2.2).

Table 1

The timing of reading the text, the timing of answering the first and second half of the questions

The variable	The Average	Standard. off	The Median	Min	Max	Interquartile range
Total test time	21,31	6,27	20,87	1,62	43,05	8,28
Text reading time	6,54	3,09	6,58	0,03	24,10	3,40
Task time (1 part)	8,04	3,15	7,42	0,93	23,18	3,77
Task time (Part 2)	6,73	2,43	6,49	0,57	18,78	3,00
"Fast bursts" (Part 1)	0,58	0,97	0,00	0,00	9,00	1,00
"Slow bursts" (Part 1)	1,01	1,37	1,00	0,00	9,00	2,00
"Fast bursts" (Part 2)	0,70	1,65	0,00	0,00	11,00	1,00
"Slow bursts" (Part 2)	1,21	1,55	1,00	0,00	10,00	2,00

Results

For explicit interpretation of the results, both groups of indicators were analyzed separately.

Stage 1. Identification of groups of students using uniformity indicators.

Figure 1 shows the dendrogram obtained from the results of cluster analysis for a group of uniformity indicators.

Based on the distance balance, a solution of six clusters was chosen.

Table 2 shows the average clusters.

Figure 2 shows how the test results of the reading assessment (z-scores) are distributed among clusters.

The Krukal-Wallis criterion showed the presence of statistically significant differences in test scores between the groups (Chi-squared = 246, .78, df = 5, p-value < 0.001). The results of the pairwise comparison did not reveal differences in test scores only between clusters 1 and 3 (p=0.437), 2 and 6 (p=0.198) (Fig. 3).

Table 3 shows how the observations were distributed by gender. Clusters were based on the information about the gender of students, because in the context of studying individual characteristics, it was previously shown that boys are more impatient, need a change of activity, and an active nature of actions [8], they

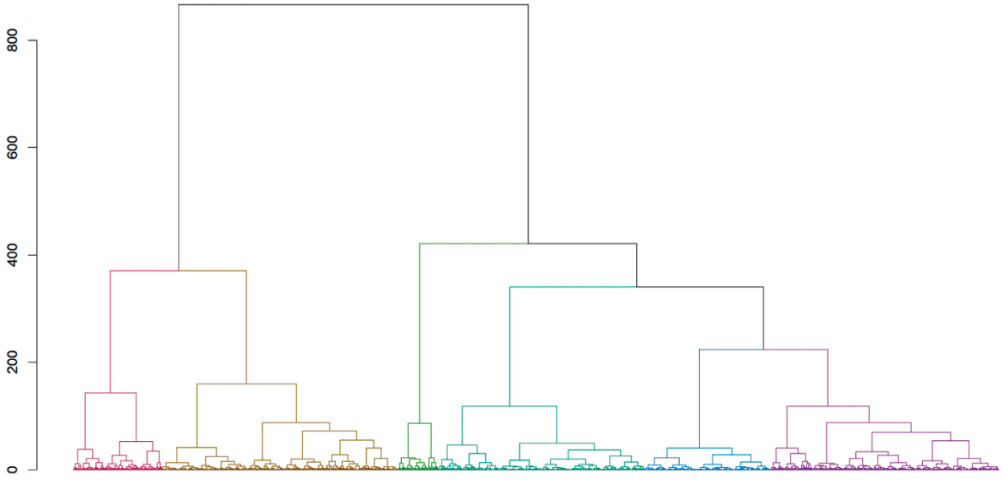

Fig. 1. Dendrogram of hierarchical cluster analysis

Table 2

Average clusters

Cluster	Number of observations	Time (min)			Bursts			
		The text	Questions (Part 1)	Questions (Part 2)	Fast (Part 1)	Slow (Part 1)	Fast (Part 2)	Slow (Part 2)
1	482	5,60	5,50	5,42	1,43	0,21	0,46	0,38
2	536	5,96	8,92	6,09	0,24	1,37	0,77	0,69
3	294	6,46	6,14	5,58	0,00	0,01	0,25	0,17
4	554	8,55	8,43	8,89	0,28	0,95	0,09	2,44
5	95	2,99	5,63	2,42	2,52	0,43	6,71	0,20
6	207	6,64	14,41	9,29	0,24	3,80	0,57	3,17

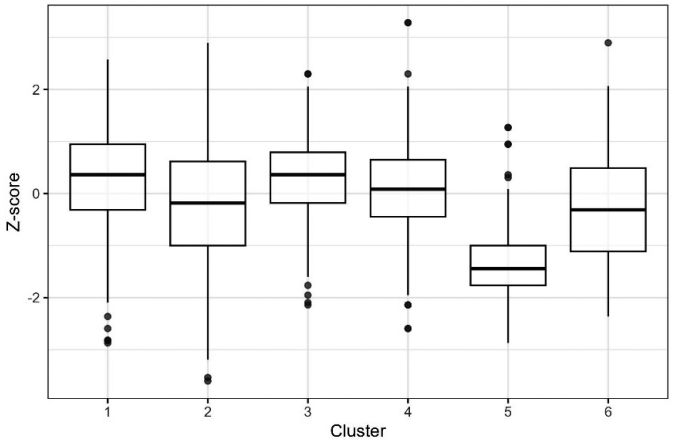

Fig. 2. Distribution of students' test scores by clusters, designed according to uniformity indicators

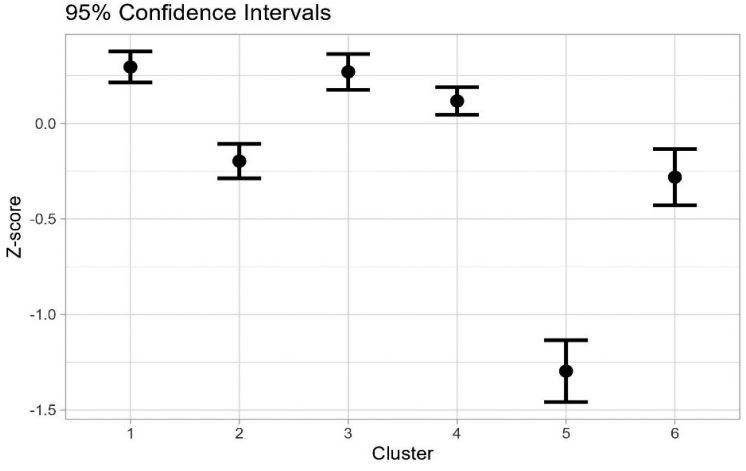

Fig. 3. Graph of 95% confidence intervals of average scores in clusters identified using uniformity indicators

also tend to evaluate their intellectual qualities and academic success higher than girls [5]. For example, in PIRLS-2018, despite the improvement in the quality of reading among boys compared to previous studies, girls still showed higher results.

The same conclusions were confirmed by Russian researchers. For example, it is shown that "boys 9—10 years old are technically superior to girls," that is, they read faster, but they are inferior in reading comprehension [4].

Table 3

For girls in clusters based on uniformity indicators

Cluster	Percentage of girls
1	0,49
2	0,52
3	0,59
4	0,54
5	0,33
6	0,61

There are statistically significantly more girls than boys in clusters 3 and 6, (chi-squared = 4.40, df=1, p<0.05 and chi-squared = 15.7, df=1, p<0.05), and in cluster 5, on the contrary, there are statistically significantly more boys (chi-squared = 6.05, df=1, p<0.05). There are no differences in gender distribution in the other clusters.

Stage 2. Identification of groups of students using linearity indicators

Figure 4 shows the dendrogram obtained from the results of cluster analysis for a group of linearity indicators.

To analyze the linearity variables, a solution of four clusters was chosen. Table 5 shows the average clusters.

The boxplot graph (Fig. 5) shows the distribution the scores on the reading test (z-scores) among the clusters.

The Krauskal-Wallis criterion showed the presence of statistically significant differences between the groups (Chi-squared = 10, .05, df = 3, p-value < 0.05). The results of the pairwise comparison revealed differences in test scores only between clusters 2 and 3 (p=0,.018 < 0,.05) (Fig. 3). At the trend level (p<0.1), differences in test scores were

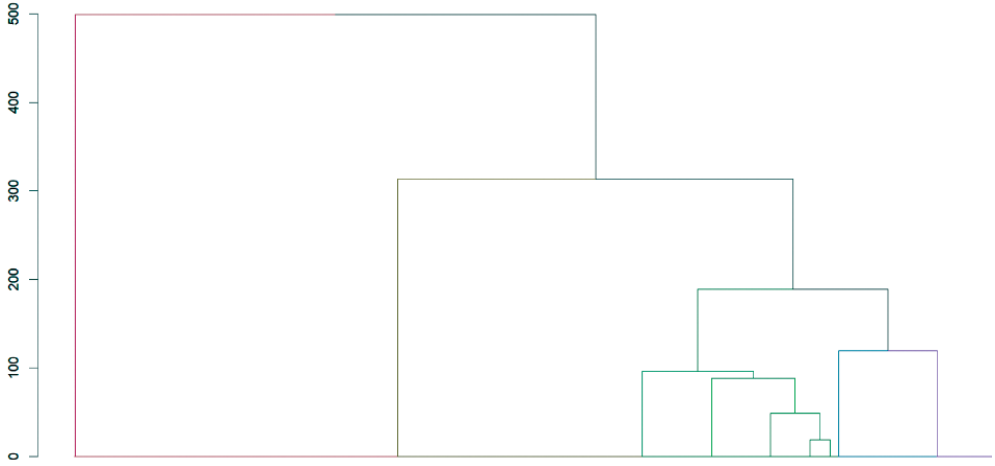

Fig. 4. Dendrogram of hierarchical cluster analysis based on linearity indicators

Table 5

Average clusters based on linearity indicators

Cluster From 1 to 5 nonlinear transitions for tasks 6 or more nonlinear transitions for tasks No returns to text_0 1 return to text 2 or more returns to text	Number of observations	No nonlinear transitions for tasks	From 1 to 5 nonlinear transitions on tasks_0	6 or more nonlinear transitions on tasks	No returns to text	1 return to text	2 or more returns to text
1	378	0	1	0	0	0,61	0,39
2	573	0	1	0	1	0	0
3	460	0,14	0	0,85	0,3	0,3	0,40
4	757	1	0	0	1	0	0

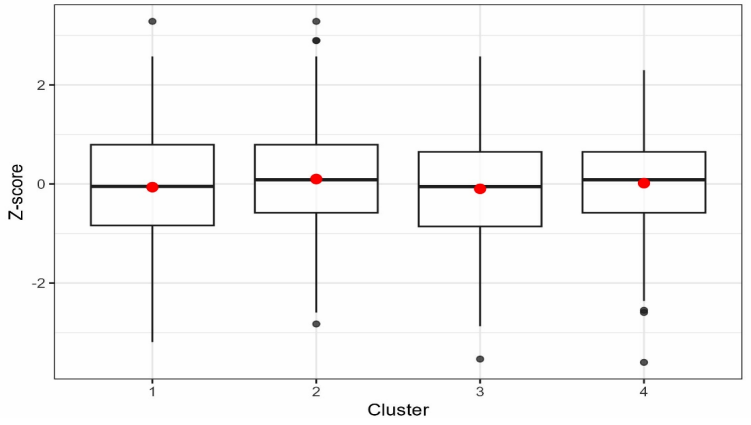

Fig. 5. Distribution of students' test scores by clusters based on linearity indicators

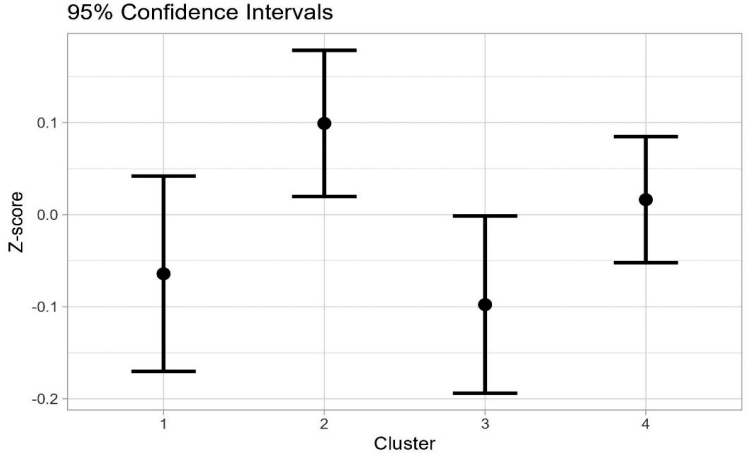

Fig. 7. Graph of 95% confidence intervals of average scores in clusters based on linearity indicators

found in clusters 1 and 2, as well as 3 and 4 (p=0.078).

Table 6 shows the distribution of the observations according to by gender.

An analysis of the proportions showed that there were no statistically significant differences in the gender distribution in the four clusters.

Table 6

Percentage of girls in clusters based on using linearity indicators

Cluster	Percentage of girls
1	0,51
2	0,53
3	0,52
4	0,54

Interpretation of the results

Based on the cluster analysis, the following results were obtained:

Clusters based on uniformity of test taking

We identified 6 groups of students in the context of linearity of transitions.

The first cluster is characterized by relatively fast and uniform test taking and the presence of "rapid bursts" in the first half of the test: students did not have problems while interacting with the test, easily answered the first few, relatively less difficult tasks.

The second cluster is characterized by a long test taking and "slow bursts" in the first half of the test. It can be assumed that these children had difficulties with the initial entry into the assessment, adapting to how to perform the test.

The third cluster is characterized by a very high degree of uniformity: it contains students with fewer "fast" and "slow" bursts.

In the fourth cluster, with a relatively long execution time for three parts of the test, a slowdown occurred in the second half of the test (possible interpretation: fatigue).

The fifth cluster includes respondents with a very short time to complete the three parts of the test and the largest number of "quick bursts" — these are "clickers", students who did not get involved in the task and showed low engagement, answered formally, it is impossible to evaluate their reading skills based on the test results, because they did not accept the learning task.

The sixth cluster consists of students with the maximum work time and "slow bursts" in the 1st and 2nd halves of the test, these are also students with the lowest (not counting "clickers") results.

Linearity clusters

We identified 4 groups based on indicators of linearity of access to questions. The most interesting clusters are 1, 2 and 4. Cluster 4 is a completely linear way of access to questions. Cluster 2 describes a pattern with a small number of accesses to questions, but a complete absence of returns to the text. Cluster 1 contains students who moved relatively slowly through the tasks and at the same time they returned to the text. The cluster includes all other students — with a fairly large number of accesses along all the test ("spontaneous surfers" — perhaps it was difficult for these students to understand the format of questions and their access indicate more or less unstructured attempts to navigate using accesses to available pages).

We expected that the absence of returns to the text would be associated with lower subject results, and, conversely, active work with test questions and returns to the text would be associated with a higher score. However, a completely linear test taking is generally associated with positive results, and students who returned to the text, on average, had a lower test score than those who did not return.

Conclusions and discussion of the results

Indicators of test behavior were presented in this study in a purpose to enrich feedback on the results of the academic assessment. By the example of the reader literacy test, we have shown how indicators of uniformity and indicators of linearity of test taking allow to group students into interpretable clusters, which is a confirmation of hypothesis 1.

The study showed the presence of deficits in meta-subject skills (which corresponds to the age of children). Thus, a combination of uniformity indicators can be a reliable criterion for identifying "clickers" — students whose subject results do not make sense to report because they did not complete the tasks.

In primary school, a significant number of students do not return to the text, and if they do, it is not associated with higher subject results. Our hypothesis 2, therefore, finds no confirmation.

The unexpected result was that completely linear passing of the test is not associated with

lower subject results. Perhaps, in elementary school, a relatively small amount of text allows you to successfully complete tasks based only on a single reading. However, the lack of the habit of returning to the text can create difficulties when reading in high school. Those students who returned to the text had a lower average test score, which is counterintuitive. Probably, in most cases, these were returns that did not improve reading efficiency.

A longer test execution time may not indicate thoughtfulness, but difficulties, and significantly lower results were found in those who "stay for a long time" on the first half of the tasks (presumably: difficulties with orientation in tasks) and on the second half of the test (presumably: fatigue, demotivation). And although the subject results of these two clusters are equally low, the work on overcoming their metacognitive difficulties should most likely differ.

Respondents with the largest number of non-linear transitions ("surfers") are also characterized by the lowest test score. This is a risk group among the subjects. Even if their active navigation on the test is caused by awareness of their own failure in reading, their cognitive strategies for adapting test behavior and changing the test trajectory are not associated with improved results. The reasons for the complete linearity of the test or "surfing" can be both insufficient experience with digital tools and the lack of a conscious strategy for completing the test.

Research prospects

The authors consider that investigation of the stability of test behavior could be an important problem for the next stage could be (whether the same patterns are repeated in the same students from test to test). In addition, it is very important to look at the functioning of the proposed indicators for students of different ages. This study also shows some gender differences in student test behavior consistent with the results of previous studies. In general, we consider it important to continue the search for interpretable indicators of test behavior that can describe the regulatory sphere of student development.

Limitations and assumptions of the study

We have no way to objectively link the indicators of test behavior with the degree of metacognitive skills formation, we can only assume that these indicators can be interpreted in terms of metacognitive skills.

The limitations of the study also include the fact that we sought to simplify complex data on children's behavior when performing tests (for example, nonlinear transitions on tasks were evaluated on the whole test, regardless of the place of tasks in the test). Additional validation of test behavior indicators and a more detailed assessment of them are required before they can be recommended as a reliable measure that can form the basis of pedagogical interventions.

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Subjective Well-being of Parents in an Inclusive School

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This work presents results of a study of the correlations between indicators of subjective well-being of parents with their assessments of an inclusive environment and satisfaction with school. 1583 parents of children with disabilities (4,2%) and without disabilities (95,8%) studying in schools in the city of Tyumen and the south of the Tyumen region were recruited for this work. The author's questionnaires "Subjective well-being", "Assessment of the inclusive environment", "Satisfaction with the school" were used. As a result, a stable relationship between the well-being of parents and their assessments of the inclusive environment and satisfaction with the school was empirically confirmed. The study showed that parental subjective well-being is characterized by a state in which it is possible to show agency and control over situations that arise, a sense of satisfaction, emotional comfort, and a level of meaningful life. The association of subjective well-being with the level of involvement in the inclusive process at school, understanding of inclusion, acceptance of the ideas and values of inclusion was revealed. Parents with a high level of subjective well-being have a significantly higher level of school satisfaction, they also value inclusion resources more and note a higher level of inclusion risks.

Keywords: subjective well-being; parents of students; inclusive education; inclusive environment; school satisfaction.

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Субъективное благополучие родителей в условиях инклюзивной школы

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Представлены результаты исследования взаимосвязи показателей субъективного благополучия родителей с их оценками инклюзивной среды и удовлетворенностью школой. В исследовании приняли участие 1583 человека — родители детей с ОВЗ (4,2%) и без ОВЗ (95,8%), обучающихся в школах г. Тюмени и юга Тюменской области. Использовались авторские опросники «Субъективное благополучие», «Оценка инклюзивной среды», «Удовлетворенность школой». В результате эмпирически подтвердилась устойчивая связь благополучия родителей с их оценками инклюзивной среды и удовлетворенностью школой. Выявлено сопряжение субъективного благополучия с уровнем вовлеченности в инклюзивный процесс в школе, пониманием инклюзии, принятием идей и ценностей инклюзии. Значимо более высокий уровень удовлетворенности школой у родителей с высоким уровнем субъективного благополучия, они также более высоко оценивают ресурсы инклюзии и отмечают более высокий уровень рисков инклюзии.

Ключевые слова: субъективное благополучие; родители учащихся; инклюзивное образование; инклюзивная среда; удовлетворенность школой.

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Introduction

Raising a child with special needs can become a prerequisite for social and personal ill-being for many families. Research shows that this is caused by many factors: low quality of life [15]; stress caused by feelings of anger, fear, anxiety and grief [18; 19; 20; 23]; neuropsychic and physical stress, fatigue, tension, uncertainty about the development of their child [1; 5; 14]; difficulties in the professional and family

spheres, stigmatization, lack of time and energy [10].

Parents face many difficulties and problems when they need to introduce their child in the formal education system. The task of choosing between inclusive and correctional education, learning at home or at school, combining rehabilitation activities with educational activities, and other issues arise. As previous studies have shown, in our country these issues still remain an area of concern for parents and great deal of difficulty [8; 11]. Today, the relationship between school and parents is often formal, sometimes even conflicting [2; 13].

However, in the general education system, the role of parents is increasing: they can participate in the creation of a student's individual educational path, an inclusive educational environment, and in the educational work of the organization [12]; parents play a key role in supporting students with special educational needs [6].

According to numerous studies, subjective well-being (SWB) is a person's subjective assessment of his life, which includes various parameters: a person's satisfaction with his own life, the degree of achievement of goals, the absence of negative feelings, mental well-being, safety and sufficiency of resources [17; 21]. Researchers have concluded that SWB consists of cognitive and affective components. The cognitive component refers to satisfaction with life in general or specific areas, while the affective component relates to emotional reactions to life events and happiness [16].

The inclusive transformation of schools, according to many scientists, is becoming a stress factor today for both parents of children with disabilities and those of children with normal development. Their concerns about teaching children in an inclusive class together, as well as their anxieties about the quality of education and the psychological well-being of their children, are noted [3; 23]. Often, parents are poorly informed, not involved in the educational process, and do not accept the values of inclusion, nor are they ready to interact with schools [7; 11]. At the same time, it is important, from a positive psychological perspective, to study not only problems but also resources within families and individuals that lie outside the individual's external environment, as well as the internal psychological strengths of individuals [4]. Parents see a positive emotional climate, organization of communication in the classroom and with teachers, access to specialist consultations and additional types of assistance as the main resources for their children [9].

Research program

The purpose of this study is to identify the correlation between indicators of parents' subjective well-being, their assessments of the inclusive school environment, and satisfaction with school.

The study was conducted in the Tyumen Region of the Russian Federation, in schools in cities such as Tyumen, Ishim, Tobolsk, Zavodoukovsk, and Yalutorovsk. It also included the districts of Tyumen, Ishim, Zavodoukovsk, Tobolsk, and Yalutorovsk. The empirical basis for the study consisted of data collected from a survey conducted with 1,583 parents whose children attend secondary schools. The data collection took place between April and May 2022.

The author's questionnaires "Subjective Well-Being", "Assessment of an Inclusive School Environment", and "Satisfaction with School" were used as diagnostic tools. Statistical analysis was carried out using the statistical software package SPSS 23.0. Factor analysis was performed using the principal component method and varimax rotation. The subjective well-being questionnaire consists of 51 questions, and points are awarded as follows: 1. Additional information is required. 2. I do not agree. 3. Rather, I disagree. 4. I somewhat agree. 5. I fully agree.

The sample of participants consisted of parents of children with disabilities (4.2%) and parents of children without disabilities (95.8%), which generally corresponded to the ratio of children in the inclusive school. There participated parents of 7—11 grade students. Most of the parents were from urban areas (1453 people), although the opinion of rural residents was also represented (130). Mostly women took part in the survey (95.5%) The distribution of parents according to their child's gender was approxi-

mately equal: 49.7% were parents of boys and 50.3% were parents of girls. Most families had two children (53.4%); 20% had one or three, and a small number had more than three. 91% of the parents had professional education, with 62.7%, having higher education and 28.3% having secondary vocational training.

Results

The mean subjective well-being score was 4.17, with a standard deviation of 0.19, revealing a high level of well-being and high stability in the results.

Of particular interest are the extreme positions in the assessment of statements. The highest-scoring statements were: “I am always aware of the natural beauty of my environment” (4.51) and “I strive to act without remorse” (4). The lowest scores were given to the statements “I am satisfied with my income level” (3.66) and “rarely feel anxious” (also 3.66).

It is encouraging that the statement on the perception of nature’s beauty has the highest score, as only a subjectively prosperous person can have the value of perceiving beauty in his value system. However, the lower income satisfaction results are realistic, given the geographical scope of the sample (see Figure 1).

The analysis did not reveal statistically significant differences in the level of SB between parents from different localities (ρ=0.163). However, a trend is visible that the SB of parents in rural areas is generally higher (except for Zavodoukovsky District). When combining samples into “urban/rural” categories, this trend becomes statistically significant (ρ = 0.030), as shown in Figure 2.

Taking into account the fact that the average lies within the same interval (more than 4 — rather agree), this finding is not significant for qualitative differences. Qualitative differences will be described below.

Let us analyze the factor model of subjective well-being for the entire sample of parents. The factor model includes three factors with an explained total variance of 53.9%: 1. Agency

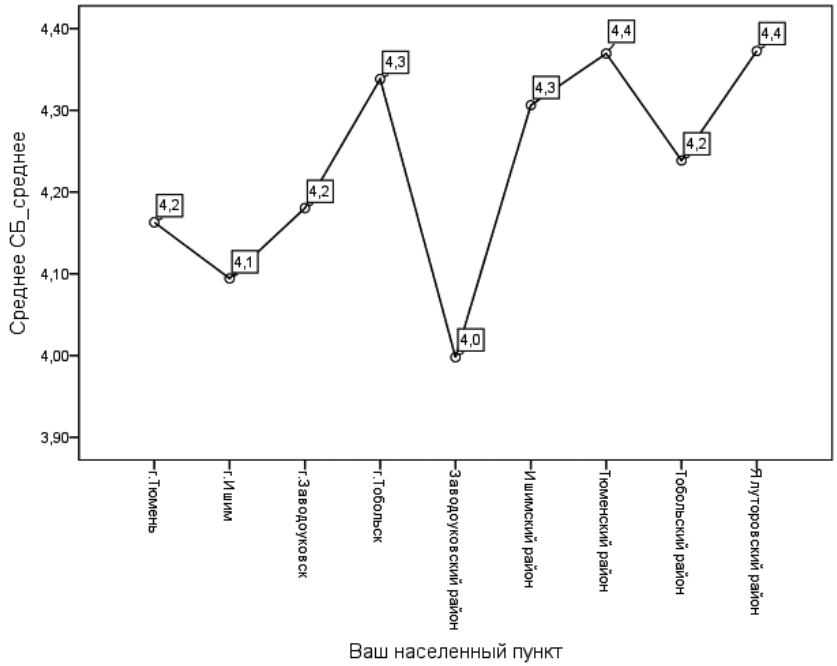

Fig. 1. SB indicator taking into account respondents’ place of residence

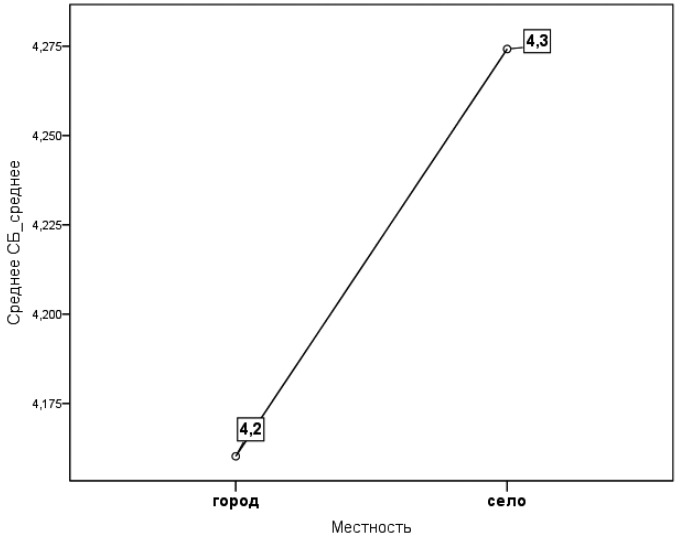

Fig. 2. SB indicator for urban/rural samples

(18.5%) — This factor includes statements that position subjective well-being in controllable contexts: “I feel generally in control of all aspects of my life” (0.57), “I always act in accordance with my goals” (0,592), “I never let a dark situation rob me of my sense of humor” (0. 529) 2. Life satisfaction (18,1%) — Parents in subjective well- being note characteristics of satisfaction: “Usually I am in good mood” (0 .758), “I am satisfied with income level” (0 ,434), “satisfied with successes and achievements” (0.482) 3. Values and meanings (17,3%) — this factor combines statements expressing a positive attitude towards values: “I’m always aware of natural beauty environment” (0 689), I try to find positive things in various life situations (0.575). Despite the difficulties, I always look forward to the future (0.626).

Therefore, the subjective well-being of the parents interviewed is a state that can be described as the ability to manage one’s life, a feeling of contentment, emotional comfort, and meaningful fulfillment. If this model of subjective well-being is applied to the educational process, the following can be assumed. The nature of the subjective well-being of parents can be influenced by several factors, including: 1) The degree to which they are able to take a subjective position, participate, and control (be involved in the organization, receive information, and have the opportunity to influence). 2) The extent to which the school can meet their current needs “here and now”. 3) Whether school situations provide positive emotional support and have a basis in values.

The next significant area of research is the analysis of subjective well-being assessments by parents with different socio-psychological profiles. First, we analyzed differences in SWB levels between parents of students residing in rural (8.2%) and urban (91.8%) settings. Of the 51 items, statistically significant differences were found in 12 (23.5%), with SB being significantly higher among rural parents. These differences apply to all three dimensions of well-being, with most related to the “Agency” dimension. That is, partially, but for each factor, parents from rural areas feel more prosperous. In particular, parents of students from rural areas believe that the context of well-being is to a greater extent provided by the possibility of their agency and control in life.

In the course of analyzing the findings from the assessment of the inclusive educational

environment, we identified three key factors, which we have conventionally referred to as: “communication”, “principles and values”, and “organization”.

The “communication” factor includes such characteristics as: involvement of students and parents in the life of the school; participation in extracurricular activities; interaction of all subjects of education with each other; availability of specialists who can help (psychologist, etc.); cooperation with other organizations; psychological and physical safety of the educational environment; support from the school administration, and so on.

The “principles and values” factor includes the following indicators: absence of discrimination, availability of social support, a positive emotional atmosphere, a caring attitude towards all, equal requirements, consideration of individual characteristics, respect and tolerance, and so on.

The “organization” factor includes the following characteristics of an inclusive educational environment: openness to education, adaptation of the learning environment to each student, barrier-free organization and material and technical conditions to ensure accessibility of the environment, organizing additional classes to develop everyone’s abilities, fair distribution of resources, availability of trained personnel such as tutors, assistants, educational psychologists and speech therapists, inclusion of parents and students in decision-making processes, etc.

These factors, with a total explained cumulative variance of 48.2% among parents of students living in the city, are distributed as follows: The first factor is “communication” (21.3%), the second — “principles and values” (15.6%), and the third is “organization” (11.3%). Thus, when assessing the inclusive environment, parents primarily focus on communication, such as “The school informs...”, “The school explains...”, and “...brings parents and teachers together.” This is an essential component of a barrier-free and inclusive educational space. Second in importance are the principles underlying an inclusive environment. Third are organizational conditions.

For parents from rural areas, an inclusive environment is primarily determined by principles and values (first factor — 25.3%). However, in this factor, principles and values are complemented by organizational conditions. Thus, the first factor for parents of students from rural areas conditionally represents “principles and values ensured by organizational conditions.” It is interesting that these values appear specifically in the rural sample. According to the analysis of variance, statements about the organization of the educational process do not differ significantly from those chosen by parents of students in urban areas. The association of statements regarding inclusive principles and values with organizational conditions in the factor model indicates that parents from rural students are not only mentally closer to inclusive values but also consider the significance of organizational infrastructure.

This is more accurately evidenced by the results of the interview. M.L. (age 36, child 8th grader): “The teachers have known all of our children since childhood, and we know all of the kids, so we help the school to prevent any quarrels.” N.N. (age 41, child 9th grader) “Of course, we don’t have enough equipment for children with special needs like in the city, not everything is modern in the schools, it’s a pity. But our teachers are professionals.” That is, compactness of residence, intensity and duration of communication, sufficient autonomy are important conditions for inclusion in education. At the same time, the significance of organizational conditions is determined from the position of awareness of their deficiency.

Data analysis made it possible to calculate the level of parents’ subjective well-being expression (Fig. 3).

The results obtained allow us to analyze the relationship between SB and the characteristics of inclusion in school (Table 1).

As we can see, parents with high levels of subjective well-being are more actively involved in the inclusive process at school (Pearson Chi-square=44.119, ρ=0.000). This is especially evident in the positions “involved in organizing events and planning” (almost 9 times), “participating in decision-making together with the school” (4 times). However, there was no signifi-

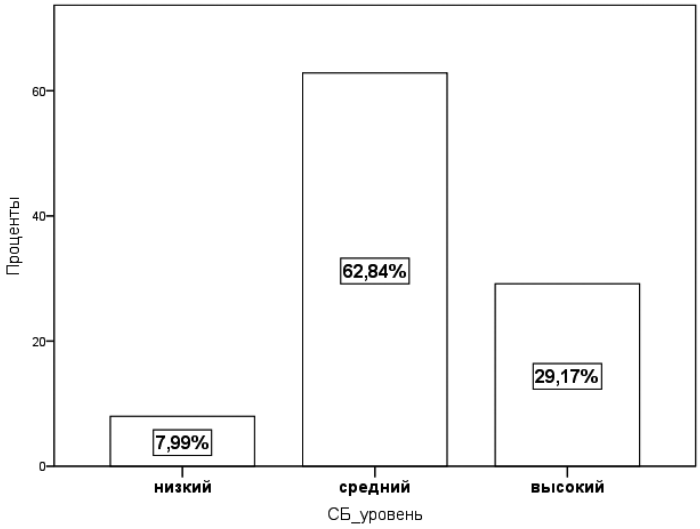

Fig. 3. Level of expression of subjective well-being of parents

Table 1

Correlations between parents' SWB and their involvement in the inclusive process in school (N=1583)

Level of involvement in the inclusive process at school	SB level		
	short	average	high
not involved at all yet	48	287	100
	38.1%	29.0%	21.7%
informed about existing programs and activities	52	434	201
	41.3%	43.8%	43.7%
I take part in events, but to a limited extent	23	205	91
	18.3%	20.7%	19.8%
involved in event organization and planning	1	40	36
	0.8%	4.0%	7.8%
I participate in decision making together with the school	2	25	32
	1.6%	2.5%	7.0%

cant association between subjective well-being and the presence of a child with a disability (Pearson Chi-square = 0.881, ρ = 0.644).

We consider this question to be one of the most important when analyzing the position of parents regarding inclusion: "How do you feel about your child studying in an inclusive environment?" Because this statement should be perceived and assessed by parents as realistically and objectively as possible (Table 2).

Although no statistically significant association was found (Pearson Chi-square=10.251, p=0.114), a trend can be seen. In particular, among parents with a high level of subjective well-being, the largest number (165 people) chose the answer "positive." This is another argument for understanding the connection between parents' subjective well-being and their position on inclusion in education.

Table 2

Correlations between parents' SWB and their attitude towards the child's education in an inclusive environment (N=1583)

How do you feel about the fact that your child will study in an inclusive environment?	SB level		
	short	average	high
I feel anxious	9	54	thirty
	9.7%	58.1%	32.3%
negative	16	113	43
	9.3%	65.7%	25.0%
neutral	69	533	222
	8.4%	64.7%	26.9%
positive	32	291	165
	6.6%	59.6%	33.8%

Let us clarify the identified trend by analyzing questions regarding understanding inclusion and acceptance of its ideas and values (Table 3).

A statistically significant correlation between subjective well-being (SWB) and parents' understanding of inclusion was revealed (Pearson chi-square = 23.525, p = 0.000), as shown in the table below. This is especially clear in quantitative terms, where over 90% of respondents choose the "I understand well" answer. This proves that subjective well-being and inclusion are linked, despite the fact that SWB is an individual characteristic and is influenced by a person's social environment.

To clarify the parents' position, the questionnaire asked the question "Do you accept the ideas and values of inclusion?" (Table 4).

Based on the data obtained, a statistically significant rcorelation was revealed between SWB (subjective well-being) and parents' acceptance of the ideas and values of inclusion (Pearson Chi-square=41.052, ρ=0.000). In other words, prosperous parents subjectively understand inclusion better and accept its ideas and values.

The data obtained and the identified trends allow us to move on to the study of differences in the assessment of inclusion in education of different samples of parents. The first questionnaire concerned parents' assessment of the school's inclusive environment. The questionnaire for parents clarified the concept of an inclusive school environment as an organization that creates conditions for the education of children with disabilities (Fig. 4).

The observed tendency towards higher assessments of the inclusive school environment by parents with high SWB was confirmed by the Mann-Whitney U test, when comparing low and high levels of SWB for all 36 statements (ρ=0.000).

Table 3

Correlations between parents' SWB and their understanding of what inclusion is (N=1583)

Do you understand what inclusion is?	SB level		
	short	average	high
no, I don't understand	27	94	58
	15.1%	52.5%	32.4%
I find it difficult to answer	38	269	102
	9.3%	65.8%	24.9%
I understand it well	61	628	300
	6.2%	63.5%	30.3%

Table 4

Correlations between parents' SB and their acceptance of ideas and values of inclusion (N=1583)

Do you accept the ideas and values of inclusion?	SB level		
	short	average	high
No	20	74	66
	12.5%	46.3%	41.3%
I find it difficult to answer	68	565	192
	8.2%	68.5%	23.3%
Yes	38	352	202
	6.4%	59.5%	34.1%

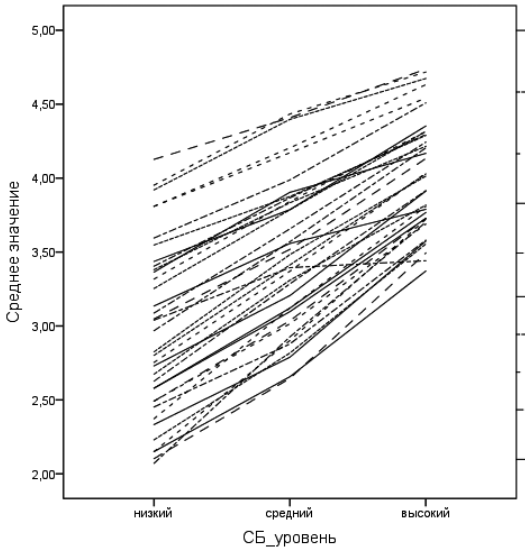

Fig. 4. Assessment of the inclusive school environment by parents with different levels of SWB (in the legend, the lines represent the average values for each statement in the questionnaire)

The second questionnaire examined the characteristics of parental satisfaction with the school (Fig. 5).

The Mann-Whitney U test confirmed significant differences in the assessment of satisfaction with school by parents with low and high levels of subjective well-being (for all 20 statements, ρ=0.000). Parents with high SWB are significantly more satisfied with schools.

We will analyze the questionnaire about resources and risks of inclusion according to these blocks (Fig. 6).

The Mann-Whitney U test confirmed significant differences in the assessment of resources and risks of inclusion by parents with low and high levels of SWB (for all 21 statements, ρ=0.000). Interestingly, on the one hand, parents with high SWB evaluated the resources of inclusion higher, demonstrating an understanding of their potential and significance. On the other hand, they also noted a higher level of inclusion risks. This confirms the previously identified phenomenon that resources and risks are not opposite contexts of inclusion. If a person

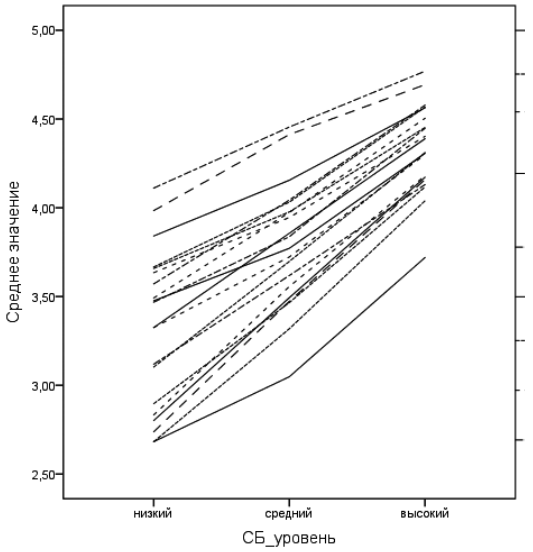

Fig. 5. Assessment of school satisfaction by parents with different levels of SWB
(in the legend, the lines represent the average values for each statement in the questionnaire)

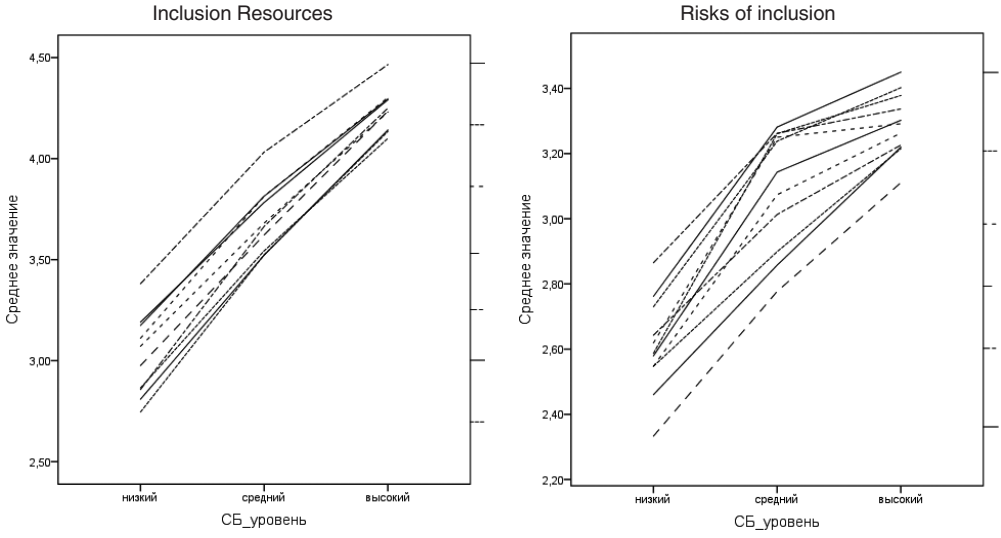

Fig. 6. Assessment of resources and risks of inclusion by parents with different levels of SWB
(in the legend, the lines represent the average values for each statement in the questionnaire)

notes the resourcefulness of inclusive education, this does not mean that he does not see its risks. These results reflect the conscious and balanced position of a person who is really involved in the educational process. In this case, the position of parents with a low level of SWB

looks much weaker, as they do not sharpen their understanding of the risks of inclusion at school, but also do not allocate its resources.

The results obtained indicate the need to analyze factor models for assessing the inclusive school environment among samples of parents with high and low SWB levels. A comparison of the factor models reveals, on the one hand, similarities in structure, but on the other, differences both in terms of loadings and content. Let us analyze these models according to the previously accepted factors: "Principles and Values", "Communication", and "Organization". The model for evaluating an inclusive environment for parents with low SWBs shows the following order of factors: Principles and Values — Organization — Communication. That is, the inclusive environment is determined by the values accepted at the school, followed by what organizational conditions have been created and how communication has been ensured. The model for assessing the inclusive environment by parents with high SWB is unique in terms of the loadings of the first factors (the first — 25.122%, the second — 22.467%, the third — 5.204%). In terms of content, it is represented by the following hierarchy: principles and values (first), communication (second), including statements related to the "organization" factor. That is, the organizational component for parents with high SWB is associated with both "principles and values" and "communication" in assessing an inclusive environment. The resulting fact of contingency can be indirectly confirmed by the results of the factor model of subjective well-being; the first factor was defined as "Agency". Therefore, in assessing an inclusive environment, the "organization" factor can be a characteristic of agency, and is included in the contexts of inclusive principles, values and communication.

Conclusions

The study traces a strong connection between the subjective well-being of parents and their assessment of the inclusive school environment and satisfaction with school. At the same time, it should be noted that this relationship was found as a result of an empirical study.

The qualitative characteristics of the data obtained allow us to conclude that subjective well-being for parents is a state which is expressed in such factors as the ability to control life, a sense of satisfaction, emotional comfort and a meaningful fulfillment of life. In our opinion, this understanding of subjective well-being among parents has a practical orientation: creating conditions to update these factors at school could help support and increase the level of parental subjective well-being.

It was revealed that subjective well-being is significantly higher among parents living in rural areas. This is associated with several characteristics of inclusion in school, such as the level of involvement in the process, understanding of inclusion, acceptance of ideas and values related to inclusion. The differences in the priorities of factors for evaluating an inclusive educational environment can serve as a guide for building partnerships with parents. For example, since communication with families living in urban areas is a priority, schools need to develop various information channels to prevent them from becoming clogged or overloaded. Providing feedback during the implementation of inclusive processes is also essential. It is important to create platforms for friendly communication, leisure groups and associations that can generate and implement solutions to improve the school environment. These efforts should be supported. The school can also improve basic communication within families through training for children and parents to understand communication patterns, transform them, and develop basic communication skills. For parents from rural areas, the inclusive environment is determined primarily by the principles and values provided by organizational conditions. Therefore, the priorities of the school's inclusive policy should include events aimed at creating an inclusive culture, promoting home and school participation of parents through awareness of the benefits of such involvement, establishing supportive structures and communities, and creating inclusive spaces.

The study recorded a significantly higher level of school satisfaction among parents with a high level of SWB (subjective well-being). In addition, they appreciate the resources of inclusion more, thereby demonstrating an understanding of its potential and significance of its values.

They also understand the risks associated with inclusion. Therefore, parents with high levels of SWB can form a pillar of support for the implementation of inclusive policies and practices at school. This task can be achieved through the targeted involvement of parents with a high level of SB in the process of decision-making and participation in inclusive educational policy at the school and neighborhood level.

The study proves, firstly, the importance of taking into account and paying attention to the "voice of parents" when designing and organizing an inclusive educational environment. This will lead to increased satisfaction with school and ensure that special educational needs are taken into consideration. Secondly, the study demonstrates the need for careful attention to the subjective well-being of parents, as parents with high levels of SWB are more willing to actively engage and support inclusive policies and practices. In addition, parents' well-being largely determines children's well-being and allows for a safe, supportive, and developmental environment in inclusive schools. Prospects for continuing research in this area may include investigating the correlation between children's, parents', and teachers' subjective well-being in the context of inclusive education transformation factors, as well as exploring parents' subjective well-being of children with special needs and the factors that influence it.

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Adaptation of the Russian Version of the Children's Somatic Symptoms Inventory on a Sample of Orphans and Children without Parental Care

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This study was aimed to adapt the Russian version of the Children's Somatic Symptoms Inventory-8 (CSSI-8). The participants were 160 orphans and children and adolescents left without parental care, including 80 girls and 80 boys aged 9 to 17 years (M=14,51; Me=15 years; SD=1,79). All participants completed CSSI-8 and the Revised Child Anxiety and Depression Scale-30 (RCADS-30). The Russian version of the inventory was reliable and valid: firstly, it has a high Cronbach's α, showing its internal reliability; secondly, it has a one-factor structure, indicating its factor validity; thirdly, the relationship of somatic symptoms with anxiety and depressive symptoms proves convergent validity. Thus, 76,2% of children and adolescents had at least one specific somatic symptom, 44,4% complained of pain in stomach or abdomen, 58,7% of headaches, 30,6% of pain in lower back, 19,4% of faintness or dizziness, 29,4% of pain in arms or legs, 28,7% of heart palpitations, nausea or upset stomach, 47,5% of weakness in some parts of the body. In conclusion, it is important to make future psychometric examinations of the adapted questionnaire, which allow us to recommend it for school diagnosis and psychological counseling of children and adolescents, as well as screening and monitoring of somatoform disorders.

Keywords: somatization; internal reliability; factor validity; convergent validity; psychometric analysis.

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Адаптация русскоязычной версии детского опросника соматических симптомов на выборке детей-сирот и детей, оставшихся без попечения родителей

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Представлены результаты адаптации русскоязычной версии детского опросника соматических симптомов (Children's Somatic Symptoms Inventory, CSSI-8). Материалом исследования стали данные, собранные на 160 детях и подростках, являющихся сиротами или оставшихся без попечения родителей, с помощью русскоязычных версий CSSI-8 и детской шкалы тревоги и депрессии (Revised Child Anxiety and Depression Scale-30, RCADS-30). Результаты проведенного исследования показали, что русскоязычная версия опросника надежна и валидна: во-первых, она имеет высокий показатель α-Кронбаха, подтверждающий ее внутреннюю надежность; во-вторых, она имеет однофакторную структуру, свидетельствующую в пользу ее факторной валидности; в-третьих, взаимосвязи соматических симптомов с тревожными и депрессивными симптомами являются доказательством конвергентной валидности. Анализируется статистика соматических симптомов у детей-сирот и детей, оставшихся без попечения родителей. Обнаружено, что 44,4% опрошенных жаловались на боли в животе или желудке, 58,7% — на головные боли, 30,6% — на боли в нижней части спины, 19,4% — на обморок или головокружение, 29,4% — на боли в руках или ногах, 28,7% — на учащенное сердцебиение, тошноту или расстройство желудка, 47,5% — на слабость в некоторых частях тела. Делается вывод о важности будущих психометрических испытаний адаптированного опросника, которые позволят рекомендовать его для школьной диагностики и психологического консультирования детей и подростков, а также скрининга и мониторинга соматоформных расстройств.

Ключевые слова: соматизация; внутренняя надежность; факторная валидность; конвергентная валидность; психометрический анализ.

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Introduction

In childhood, a child goes through certain stages associated with the development of mechanisms of mastering his own body, learning the logic and nature of his physicality. Healthy development involves the process of desomatization, when the child learns the psychological resolution of emotional discomfort (for example, asks for help, talks about his feelings, tries to negotiate), and adverse development triggers the process of resomatization, when the child expresses his condition through somatic response (for example, suffers from physical pain that arose after emotional shocks and have no physiological justification) [26].

Childhood and adolescent somatization is a chronic, predictably developing process: in young children, somatic symptoms are isolated and usually boil down to repeated complaints on headaches and abdominal pain [11; 23], but as children and adolescents grow older, they increasingly experience a complex of specific somatic symptoms with the most frequent and intense experiences of pain in the extremities, muscle aches, fatigue and neurological symptomatology [31; 32]. According to epidemiological studies, from 33.7% to 69.2% of children and adolescents complain of certain symptoms that do not receive physiological justification during medical examinations [6; 20; 24]. Children and adolescents with somatic symptoms are more likely to skip classes at school and to suffer from psychological distress and psychiatric comorbidity [13], turn to health resources, undergo unnecessary medical interventions and are at risk of disability [15], than their peers who do not have complaints about somatic health.

Russian pediatricians and child psychiatrists often encounter the problem of somatization. They note that the somatization of mental disorders in childhood and adolescence manifests itself in the form of pathologies of the gastrointestinal tract, skin changes, disorders of the musculoskeletal system, cardiovascular manifestations and other somatic symptoms and diseases, and also draw attention to the fact that the diagnosis and therapy of childhood and adolescent somatization helps to prevent psychosomatic diseases of adulthood at its early stage [1].

In foreign practice, the Children's Somatic Symptoms Inventory (CSSI) is widely used to examine the severity of somatization and specific somatic symptoms [28; 30]. CSSI was developed on the basis of the criteria of somatization disorder according to DSM-III-R and the somatization factor from the Hopkins Symptom Checklist and became the main instrument for screening and monitoring of childhood somatization worldwide [8]. The questionnaire has been successfully translated and adapted into Persian [14], Spanish [22], Polish [9], German [12], Turkish [16], Dutch [21], Italian [6] and Ukrainian [18], and also has a short psychometrically based version, a list of eight somatic symptoms ("Gastric or abdominal pain", "headaches", "pain in lower back", "faintness or dizziness", "pain in arms or legs", "heart beating too fast", "nausea or indigestion", "weakness in parts of body") [27].

The questionnaire has not yet been adapted into Russian, and therefore the aim of this study was the Russian adaptation of a short version of the Children's Somatic Symptoms Inventory-8 (CSSI-8).

Organization and methods of research

Procedure. The survey was conducted in January-February 2023 in several orphanages with the permission of the administration and with the participation of psychologists and educators working in these organizations. We invited children and adolescents aged 8 to 18 years old who are

able to take written tests and do not have chronic mental and somatic diseases.

Children and adolescents completed the online questionnaire on their own, but had the opportunity to contact psychologists and educators if they had difficulties understanding the test statements.

Participants. 160 children and adolescents were recruited for this stiudy, including 80 girls and 80 boys aged 9 to 17 years (M=14,51; Me=15 years; SD=1,79).

Methods. Children and adolescents who participated in the study completed the following diagnostic materials:

1. The Children's Somatic Symptom Inventory-8 (CSSI-8) examines the severity of somatization in children and adolescents based on self-reports on eight specific somatic symptoms [30]. According to the instructions, childred were asked to assess how much each symptom has bothered them over the past two weeks on a Likert scale from 0 ("not at all") to 4 ("very often"). The questionnaire was translated into Russian with the participation of a child psychiatrist and a health expert.

2. The Revised Child Anxiety and Depression Scale-30 (RCADS-30) measures the symptoms of major depressive disorder ("I feel worthless"), panic disorder ("All of a sudden I feel really scared for no reason at all"), social phobia ("I worry what other people think of me"), separation anxiety disorder ("I feel scared if I have to sleep on my own"), generalized anxiety disorder ("I worry that something bad will happen to me") and obsessive-compulsive disorder in childhood ("I have to keep checking that I have done things right") [25]. According to the instructions, the child needs to assess how often he experiences certain states and experiences, on a Likert scale from 0 ("never") to 3 ("always"). The measure was translated into Russian with the participation of a child psychiatrist and a health expert, and also checked for factor validity ($\chi^2(364)=594$, $p<0,001$; CFI=0,918; TLI=0,903; SRMR=0,052; RMSEA=0,063 [0,054; 0,072]) and internal reliability ($\alpha=0,80$ for the scale of major depressive disorder; $\alpha=0,84$ for the scale of panic disorder; $\alpha=0,83$ for the scale of social phobia; $\alpha=0,76$ for the scale of separation anxiety disorder; $\alpha=0,83$ for the scale of generalized anxiety disorder; $\alpha=0,77$ for the scale of obsessive-compulsive disorder).

Analytic strategy. We used descriptive statistics, the Cronbach's alpha coefficient, the Pearson correlation coefficient, the Pearson's chi-squared test and confirmatory factor analysis by the maximum likelihood method. The Cronbach's alpha coefficient should be ≥0,7 [29]. The factor structure corresponds to the initial data in the comparative fit index (CFI)≥0.90; the Tucker-Lewis index (TLI)≥0,90; standardized root mean square residual (SRMR)≥0,08; root mean square error of approximation (RMSEA)<0,95 [5; 10; 19]. The Pearson correlation coefficient and the Pearson chi-squared test are statistically significant at $p<0.05$. Data analysis was performed in Jamovi 2.3.21 and IBM SPSS for Windows 23.0.

Ethical considerations. The study was conducted in compliance with the ethical code of the Russian Psychological Society and the principles of the Helsinki Declaration adopted by the World Medical Association.

Results

The Russian version of the CSSI-8 was internally consistent ($\alpha=0,84$). The prevalence of specific somatic symptoms ranged from 19,4% (for reports of fainting or dizziness) to 58,7% (for reports of headaches), while 76,2% of children had at least one somatic symptom and from 1,9% to 10,7% of the children surveyed complained of frequent and very frequent somatic symptoms. Table 1 shows descriptive statistics for the CSSI-8 items, the Cronbach's alpha coefficients when excluding items from the questionnaire, and the prevalence of somatic symptoms.

Table 1

Descriptive statistics, the Cronbach's alpha coefficients and the prevalence of somatic symptoms

CSSI-8 items		M	SD	α	Skewness	% of any positive responses
1	Gastric or abdominal pain	0,62	0,82	0,82	1,30	44,4
2	Headaches	0,93	1,01	0,83	1,01	58,7
3	Pain in lower back	0,52	0,90	0,83	1,74	30,6
4	Faintness or dizziness	0,28	0,62	0,83	2,40	19,4
5	Pain in arms or legs	0,44	0,82	0,83	2,25	29,4
6	Heart beating too fast	0,43	0,77	0,83	1,88	28,7
7	Nausea or indigestion	0,41	0,75	0,82	2,28	28,7
8	Weakness in parts of body	0,78	1,05	0,82	1,44	47,5

Note. α = the Cronbach's alpha coefficients when excluding items; the asymmetry is indicated with a standard error of 0,192.

The confirmatory factor analysis showed that the original CSSI-8 model has low data compliance ($\chi^2(20)=55,7$, $p<0,001$; CFI=0,914; TLI=0,880; SRMR=0,052; RMSEA=0,106 [0,073; 0,139]). After analyzing the modification indices and making covariance between the errors of item 1 ("gastric or abdominal pain") and item 7 ("nausea or indigestion"), the model showed acceptable compliance with the data ($\chi^2(19)=43,3$, $p<0,001$; CFI=0,942; TLI=0,914; SRMR=0,046; RMSEA=0,090 [0,054; 0,125]). The total somatization factor included items with factor loading from 0,41 to 0,58. Table 2 presents factor loadings and standard errors for the CSSI-8 items.

Somatic symptoms were associated with symptoms of anxiety and depression. Table 3 shows the correlation coefficients between the CSS-8 and RCADS-30 scores.

Somatization depended on the gender, but not on the age of the children and adolescents (r=0,047, p=0,559). Girls were more likely to complain about gastric or abdomienal pain ($\chi^2(1)=18,459$, $p<0,001$), headaches ($\chi^2(1)=8,356$, $p=0,004$), pain in lower back ($\chi^2(1)=4,972$, $p=0,026$), faintness or dizziness ($\chi^2(1)=9,002$, $p=0,003$), heart beating too fast ($\chi^2(1)=5,980$, $p=0,014$), nausea or indigestion ($\chi^2(1)=8,356$, $p=0,004$), weakness in parts of body ($\chi^2(1)=8,120$, $p=0,004$), but not about a pain in arms or legs ($\chi^2(1)=4,394$, $p=0,036$). The statistics of specific somatic symptoms in girls and boys are presented in Table 4.

Table 2

Factor loading and standard errors for the CSSI-8 items

CSSI-8 items		Factor loading	Standard error
1	Gastric or abdominal pain	0,48	0,06
2	Headaches	0,58	0,08
3	Pain in lower back	0,55	0,07
4	Faintness or dizziness	0,41	0,05
5	Pain in arms or legs	0,49	0,06
6	Heart beating too fast	0,52	0,06
7	Nausea or indigestion	0,51	0,06
8	Weakness in parts of body	0,74	0,08

Table 3

Correlations between the CSSI-8 and RCADS-30 scores

	RCADS-30 scales	CSSI-8 total score
1	Symptoms of major depressive disorder	0,43
2	Symptoms of panic disorder	0,46
3	Symptoms of social phobia	0,30
4	Symptom of separation anxiety disorder	0,31
5	Symptoms of generalized anxiety disorder	0,42
6	Symptoms of obsessive-compulsive disorder	0,41

Table 4

The statistics of somatic symptoms in girls and boys

	Somatic symptoms	Girls (%)	Boys (%)
1	Gastric or abdominal pain	61,3	27,5
2	Headaches	70,0	47,5
3	Pain in lower back	38,8	22,5
4	Faintness or dizziness	28,7	10,0
5	Pain in arms or legs	32,5	26,3
6	Heart beating too fast	37,5	20,0
7	Nausea or indigestion	36,3	21,3
8	Weakness in parts of body	58,8	36,3

Discussion

The results of this study, aimed at the Russian adaptation of the short version of the Children's Somatic Symptoms Inventory-8 (CSSI-8), showed the psychometric soundness of the adapted instrument. The high Cronbach's alpha coefficient (α=0,84) confirmed the internal reliability of the adapted questionnaire. The one-factor model, which repeats the original structure of the questionnaire and incorporates all eight somatic symptoms into a single somatization factor, testifies in favor of the factor validity of the Russian version of the CSSI-8. The correlation between somatic symptoms and anxiety and depressive symptoms confirmed the convergent validity of the adapted questionnaire. Previously, experts identified the comorbidity of somatoform, anxiety and depressive disorders in clinical practice [13] and the relationship between somatic, anxiety and depressive symptoms in correlation studies [24]. Moreover, some researchers argue that a somatic symptom can be considered as a sign of an advanced anxiety or depressive disorder and should be carefully studied not only by pediatricians, but also by child psychiatrists and psychologists [20].

Among the participants, 76,2% of orphans and children left without parental care had at least one somatic symptom and complained about gastric or abdominal pain (44,4% of cases), headaches (58,7% of cases), pain in lower back (30,6% of cases), faintness or dizziness (19,4% of cases), pain in arms or legs (29,4% of cases), heart beating too fast (28,7% of cases), nausea or indigestion (28,7% of cases) and weakness in parts of body (47,5%). These values exceed the previously detected 33,7—69,2% of cases of somatization in children and adolescents growing up in biological families, and emphasize the fact that the Russian version of the CSSI-8

was adapted on a specific sample [6; 20; 24]. It can be assumed that orphans and children left without parental care express psychological distress in the form of somatic symptoms and diseases as more obvious and requiring adult help and attention signs of distress than symptoms of mental health and developmental disorders. Earlier, Russian experts found that the psychosomatic health of children placed in foster care gets better within a year after they leave an orphanage [2].

We also found that somatization depends on gender, but not on the age of orphans and children left without parental care. The high susceptibility of girls to somatization is a well-known effect that persists into adulthood and is associated with the fact that women have greater visceral sensitivity, notice and describe somatic symptoms earlier and more accurately, encounter stereotypes less often regarding the ways of manifestation of somatic distress, and are also more often exposed to traumatic situations during their lives, leading to the development of somatic symptoms and psychosomatic diseases [3]. Foreign experts note that gender differences in the severity of somatization become noticeable at the age of 13, soften by the age of 15, but remain statistically significant throughout later life [3; 7; 24]. The fact that this study revealed the absence of age differences in the symptoms of somatization may be due to the fact that somatization is considered one of the earliest mechanisms of response to psychological distress, which is successfully consolidated and repeated at any age period when encountering traumatic circumstances [26].

The present study has a number of limitations and prospects related to overcoming them. The main limitation is the size and specificity of the study sample. Psychometric analysis should be based on data from broader categories of respondents, include materials from a survey of children and adolescents with somatic diseases [30]. Another limitation is the lack of control over the variables affecting the course of somatization in childhood and adolescence [4; 13]. A significant limitation also lies in the absence of such objective criteria for somatization as information on the prevalence of school absences, statistics on children and adolescents' visits to medical institutions. The prospects for further psychometric testing of the Russian version of the CSSI-8 are related to the need for its testing in clinical (including on a sample of children with somatic diseases and somatoform disorders) and population conditions, since this will allow us to recommend the questionnaire for use in screening and monitoring of somatoform disorders in childhood and adolescence, as well as in the practice of school diagnostics and psychological counseling of children and adolescents [17].

Conclusion

1. The Russian version of the Children's Somatic Symptoms Inventory, adapted in this study, is psychometrically consistent, and therefore can be recommended for the diagnosis of somatization in orphans and children left without parental care.

2. The adapted questionnaire needs further psychometric examinations, namely, approbation in clinical and population conditions, upon successful completion of which it can be recommended for solving a number of diagnostic and consulting tasks.

Приложение

Русскоязычная версия детского опросника соматических симптомов (Children's Somatic Symptoms Inventory-8, CSSI-8)

Инструкция. Перед тобой ряд симптомов, которые касаются здоровья и настроения детей и подростков. Оцени, пожалуйста, насколько часто тебе приходилось испытывать каж-

дый из этих симптомов в течение прошедших двух недель, используя следующую шкалу ответов:

совсем нет	редко	иногда	часто	очень часто
0	1	2	3	4

1	Боли в животе или желудке	0	1	2	3	4
2	Головные боли	0	1	2	3	4
3	Боли в нижней части спины	0	1	2	3	4
4	Обморок или головокружение	0	1	2	3	4
5	Боли в руках или ногах	0	1	2	3	4
6	Учащенное сердцебиение	0	1	2	3	4
7	Тошнота или расстройство желудка	0	1	2	3	4
8	Слабость в некоторых частях тела	0	1	2	3	4

Обработка результатов. Для получения общего показателя соматизации нужно сложить оценки по всем пунктам опросника. Чем выше общий показатель, тем более тяжелой считается детская и подростковая соматизация.

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Indiscipline Among Senior Secondary School Students: The Contributions of Home Behaviour Control and Religiosity

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The study investigated the indiscipline of senior secondary school students and the contribution of home behaviour control and religiosity in Cross River State, Nigeria. An ex-post facto research design was adopted for the study. The population comprised 62,501 senior secondary school students in three educational zones. A multistage sampling procedure was adopted to select 1250 students from 30 randomly sampled public and private secondary schools. The Student Opinion Questionnaire (SOQ) was used for data collection. Experts in measurement and evaluation and educational psychology validated the instrument. The test-retest reliability coefficient ranged from 0,78—0,91. The data collected were analysed using one-way analysis of variance (ANOVA). The results revealed that home behaviour control and home religiosity significantly influenced secondary school students' indiscipline behaviour. Specifically, students from firm homes and with high levels of religiosity generally exhibited lower indiscipline behaviour across all the dimensions. In comparison, those from lax homes and homes with low levels of religiosity manifested higher levels of indiscipline behaviour. These findings align with role theory, which suggests that individuals' behaviour is shaped by their immediate social environment. Policymakers can use these results to develop programs that promote positive behaviour by encouraging the development of a strong religious foundation in the home and promoting clear expectations and rules for behaviour.

Keywords: ANOVA; behavioural control; educational; legal; moral; personal; safety.

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Недисциплинированность среди учащихся старших классов средней школы: роль домашнего контроля поведения и религиозности

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В исследовании изучается недисциплинированность учащихся старших классов средней школы и роль домашнего контроля поведения и религиозности на примере штата Кросс-Ривер, Нигерия. Для исследования была использована модель ex-post facto. В качестве объекта исследования выступили 62 501 учащихся старших классов средней школы в трех образовательных зонах. Для отбора 1250 учащихся из 30 случайно выбранных государственных и частных средних школ была использована многоступенчатая процедура. Для сбора данных использовалась анкета Мнение ученика (SOQ). Эксперты в области измерения, оценки и психологии образования валидировали данную анкету. Коэффициент надежности «тест-ретест» варьировался в пределах 0,78—0,91. Собранные данные были проанализированы с помощью одностороннего дисперсионного анализа (ANOVA). Результаты показали, что контроль поведения в семье и религиозность семьи оказывают значительное влияние на поведение учащихся средней школы. В частности, учащиеся из крепких семей и с высоким уровнем религиозности в целом демонстрировали более низкий уровень недисципли-

нированного поведения по всем параметрам. В то время как учащиеся из некрепких семей и семей с низким уровнем религиозности демонстрировали более высокий уровень недисциплинированного поведения. Эти результаты соответствуют ролевой теории, которая предполагает, что поведение людей формируется под влиянием их ближайшего социального окружения. Политики могут использовать эти результаты для разработки программ, которые способствуют позитивному поведению, поощряя развитие сильной религиозной основы в семье и продвигая четкие ожидания.

Ключевые слова: ANOVA; поведенческий контроль; воспитание; право; мораль; личность; безопасность.

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Introduction

The primary objective of sending children to school is to facilitate their education and foster discipline, as schools serve as pivotal institutions for knowledge dissemination and character development across cognitive, affective, and psychomotor domains, thereby offering a comprehensive educational experience [8; 19; 20; 46]. Regrettably, there is a prevailing trend of disciplinary challenges within the educational framework, notably within secondary education systems worldwide [11; 62]. A significant proportion of secondary school students exhibit a lack of reverence for authority and a deficiency in demonstrating responsibility through adherence, dedication, or allegiance to established regulations [37; 38; 59]. Scholars have conceptualised indiscipline as actions that contravene established school policies and protocols, thus impeding educational institutions' seamless and organised operation [1; 28; 33; 39]. The dimensions of school indiscipline encompass moral, personal, legal, safety, and educational aspects [1].

Moral indiscipline in schools encompasses violations of rules and regulations, particularly regarding sexual misconduct, deceit, and other behaviours detrimental to the school environment [31]. Personal indiscipline signifies a failure to exercise self-control and adhere to institutional guidelines, evident in habitual tardiness, incomplete assignments, dress code violations, class disruptions, and engagement in disruptive or unhealthy behaviours [44]. The prevalent rudeness, disobedience, and lack of respect for authority figures among students underscore the extent of personal indiscipline [44]. Legal indiscipline entails students breaching governmental or institutional laws and regulations, including theft, drug abuse, assault, harassment, cyberbullying, vandalism, and record falsification [53]. Safety indiscipline among students entails failing to adhere to safety regulations established by educational institutions or the community, endangering themselves and others by disregarding safety protocols, participating in risky activities, and neglecting precautions. Educational indiscipline occurs when students engage in behaviours that hinder academic performance, disrupt classroom dynamics, and negatively impact the learning atmosphere, such as absenteeism, tardiness, classroom disruptions, cheating, and plagiarism [9; 21; 45]. School indiscipline harms students, staff, management, and society regardless of the form [1].

In the past decade, extensive research has focused on addressing indiscipline in schools, with studies aiming to understand contributing factors. Previous research has examined the causes and types of indiscipline (e.g., [17; 43; 61), including investigations into factors specific to African schools (e.g., [4; 7; 13; 57]). Notably, studies (such as [13; 17]) have highlighted the environment and home as crucial influences on students' discipline. However, there is a dearth of quantitative research on the extent of the impacts of these factors, necessitating further

investigation to quantify their effects on student behaviour. Previous research has established a link between students' indiscipline and academic performance [32; 40; 50], consistently showing that indiscipline is correlated with lower academic achievement [5; 10; 18; 36]. However, there is a gap in understanding of the factors driving students' indiscipline. While existing studies demonstrate the association between indiscipline and academic outcomes, there is limited research on the underlying causes of this association. This study addresses this gap by investigating the influence of home behaviour and religiosity on students' indiscipline. The study aimed to inform the development of effective interventions promoting school discipline by exploring the relationships among home behaviour, home religiosity, and students' indiscipline.

Theoretical grounds and literature review

Role theory is a foundational framework for this study, highlighting the significance of social roles in influencing individual behaviour and interactions. It underscores that individuals acquire and internalise social roles through socialisation, with society comprising a network of such roles [24]. The theory posits that social roles are crucial in organising society and maintaining social order. According to role theory, disciplined behaviour is a product of individuals' participation in interaction processes, with sociological perspectives emphasising the impact of these interactions on shaping individuals' actions [24].

Role theory holds relevance to this study, as it underscores the influence of social roles on individual behaviour and interactions. Specifically, this research centres on the roles of parents or guardians in shaping children's behaviour through their religiosity and household conduct. According to role theory, parents or guardians fulfil social roles characterised by specific patterns of behaviour and attitudes, which they transmit to their children through socialisation. Inadequate performance of these roles by parents or guardians may lead to failure to instil positive values and behaviours in their children, potentially contributing to students' indiscipline in school. This study aimed to enhance our understanding of how social roles influence individual behaviour and interactions by investigating the predictive roles of home religiosity and household behaviour in students' indiscipline.

Home behaviour

The role of the home in behaviour regulation involves the disciplinary approach adopted by parents [35]. Its objective is to instil in the child a sense of expected behaviours while fostering self-control and self-direction to govern their actions [36]. Isangedighi, referenced in [12], delineates parents' three primary behaviour control techniques: stern, firm, and lax. Parents who use stern behaviour control treat obedience as a fundamental virtue and curtail a child's autonomy [11; 37]. In such households, children receive explicit directives with limited room for personal initiative [9]. Consequently, under this behaviour control paradigm, children seek socialisation primarily among peers and perceive their home environment as hostile, inducing fear, dependence on parental authority, and irrational submission [16].

Firm behaviour entails employing various strategies to guide children in fulfilling their responsibilities, with disciplinary measures as a last resort [23]. Within firm home behaviour control, parents utilise explanations, discussions, and reasoning to aid children in comprehending the rationale behind expected behaviours [34]. Punitive actions are reserved for instances where a child's failure to comply with expectations appears unintentional. Firm parents adopt a democratic approach and establish boundaries for their children, engaging in reasoned discourse as they mature [29]. These parents employ judicious authority and substantial reinforcement to promote desirable behaviour [55].

According to Gittins and Hunt [25], lax home behaviour control reflects a laissez-faire approach to discipline characterised by nonchalant permissiveness. Children in such environments often engage in unrestricted behaviour due to the absence of guidance or direction, potentially leading to negative behavioural outcomes [56]. Parents consistently exhibit acceptance, benevolence, and affirmation toward their children's impulses, readily granting them considerable freedom for physical survival [12]. While these parents refrain from directing their children to-

ward socially acceptable behaviours or imposing punitive measures, they allow them to navigate challenging situations without guidance [22].

Past research indicates that adolescents from lax parenting environments are more prone to delinquent behaviour than those from households with firm and stern parenting approaches [6; 30; 47; 48]. Shi and Zhu [53] underscored the role of behaviour control in personality development, self-esteem, discipline, and academic performance. Cutrín et al. [15] supported this notion and revealed that home behaviour control impacted antisocial behaviour. However, Wertz et al. [58] found no substantial association between the home atmosphere and adolescent antisocial behaviour. Obando et al. [44] argued that additional social factors might contribute to adolescents' antisocial conduct.

The cited studies indicate several gaps that warrant attention in the current investigation. First, while these studies imply a correlation between parenting style and adolescent behaviour, they do not specifically explore the impact of home behaviour control on students' discipline within educational settings. Second, variations in the definitions of parenting styles across studies may hinder the comparability of findings. Therefore, a new study should operationalise home behaviour control. Third, some research has suggested that additional social factors may influence adolescent behaviour [44], prompting consideration in future investigations. While certain studies associate permissive parenting styles with heightened levels of deviant behaviour among adolescents [6; 30], others (e.g., [58]) find no significant relationship between the home environment and antisocial behaviour in adolescents. Similarly, Cutrín et al. [15] establish a connection between home behaviour control and antisocial conduct, whereas Obando et al. [44] argue for the influence of other social factors on adolescent antisocial behaviour. These inconsistencies underscore further research's need to elucidate the relationship between home behaviour control and students' discipline.

Home religiosity

Religiosity encompasses individuals' commitment to religious beliefs, principles, and practices [27]. Home religiosity, which includes beliefs about greater power and participation in faith-related activities at home, is influenced by the environment in which children grow and learn [2; 3]. The transmission of religious beliefs across generations can impact health and behaviour, with elements such as attending religious services, engaging in faith-based activities, praying, and studying religious texts being central [42; 52]. Families engaging in religious activities can positively influence children, potentially fostering discipline [14; 52]. However, empirical evidence is needed to support this assertion.

Previous research has identified parental religiosity, family relationship quality, and traditional family structure as key factors influencing offspring religiosity [26; 49]. High levels of religious engagement at home have been associated with reduced delinquency among children [52]. Studies suggest a potential link between religiosity and student discipline. For example, Yakovleva [60] reported that students from religious households were less likely to participate in cult activities. Similarly, other researchers have observed lower levels of antisocial behaviour among pupils from homes with strong religious indoctrination than among those with weaker indoctrination [41; 54].

The cited studies agree that religious practices and moral values significantly impact students' discipline and likelihood of engaging in antisocial behaviour. However, there are discrepancies in the findings, with some suggesting that students from homes with strong religious indoctrination exhibit lower levels of antisocial behaviour, while others suggest the opposite. Thus, further research is necessary to clarify the existing arguments about the role of home religiosity as a predictor of students' discipline. This study addresses this gap by examining the influence of parental behaviour control on students' discipline.

Hypotheses

Ha_1: Home behaviour control significantly influences students' indiscipline behaviour in secondary schools.

Ho_1: Home behaviour control does not significantly influence students' indiscipline behaviour in secondary schools.

Ha_2: Home religiosity significantly influences students' indiscipline behaviour in secondary schools.

Ho_2: Home religiosity does not significantly influence students' indiscipline behaviour in secondary schools.

Methods

Research design

We utilised an ex post facto design, which examines preexisting relationships between variables. Due to ethical and practical constraints, manipulating independent variables such as home behaviour control and religiosity is unfeasible. The ex post facto design allows us to observe the effects of these variables on student indiscipline within natural settings. Furthermore, this approach facilitates the establishment of cause-and-effect relationships by comparing disciplinary behaviours across households with varying levels of behaviour control and religiosity.

Study participants

The population of this study comprised 82,306 senior secondary school students (Males = 42,661; females = 39,654) in the Cross River State, Nigeria. A total of 40,146 students (males = 20,519; females = 19,627) were in public secondary schools, while 42,160 (males = 22,142; females = 20,018) were from private secondary schools. The population distribution of the study participants based on education zone in the state was as follows: Calabar Zone = 17,381 students; Ikom = 12,914 students; and Ogoja Zone = 11,865 students. A multistage sampling method was employed to select the study sample. Initially, schools were stratified across three education zones: Calabar, Ikom, and Ogoja. Subsequently, 6% of the public and private schools in each zone were randomly chosen. This process resulted in the selection of nine schools in Calabar (4 public, 5 private), 11 in Ikom (5 public, 6 private), and 10 in Ogoja (4 public, 6 private), for a total of 30 secondary schools (17 private, 13 public). In the second stage, students were stratified by class, focusing on the SSI and SS II classes. Within each stratum, 2% of the student population was sampled, totalling 1250 students. The sample distribution included 507 students from Calabar (245 public, 262 private), 405 from Ikom (207 public, 198 private), and 338 from Ogoja (156 public, 182 private), comprising 1250 students (608 public, 642 private). A breakdown of the participants' demographic variables is presented in Table 1.

Table 1

Sample distribution of the study

Variable	Levels	Sample distribution across the three education zones						Total
		Calabar (n = 507)		Ikom (n = 405)		Ogoja (n = 338)		
		Public	Private	Public	Private	Public	Private	
Sex	Male	115 (46.94)	125 (47.71)	100 (48.31)	97 (48.99)	73 (46.79)	89 (48.90)	599 (47.92)
	Female	130 (53.06)	137 (52.29)	107 (51.69)	101 (51.01)	83 (53.21)	93 (51.10)	651 (52.08)
	Total	245 (48.32)	262 (51.68)	207 (51.11)	198 (48.89)	156 (46.15)	182 (53.85)	1250 (100.0)
Age	< 15 years	31 (12.65)	67 (25.57)	32 (15.46)	78 (39.39)	16 (10.26)	42 (23.08)	266 (21.28)
	15—18 years	116 (47.35)	108 (41.22)	133 (64.25)	97 (48.99)	93 (59.62)	103 (56.59)	650 (52.00)
	> 18 yrs	98 (40.00)	87 (33.21)	42 (20.29)	23 (11.62)	47 (30.13)	37 (20.33)	334 (26.72)
	Total	245 (48.32)	262 (51.68)	207 (51.11)	198 (48.89)	156 (46.15)	182 (53.85)	1250 (100.0)
Class	SS1	90 (36.73)	110 (41.98)	82 (39.61)	81 (40.91)	59 (37.82)	77 (42.31)	499 (39.92)
	SS2	70 (28.57)	90 (34.35)	65 (31.40)	62 (31.31)	56 (35.90)	44 (21.18)	387 (30.96)
	SS3	85 (34.69)	62 (23.66)	60 (28.99)	55 (27.78)	41 (26.28)	61 (33.52)	364 (29.12)
	Total	245 (48.32)	262 (51.68)	207 (51.11)	198 (48.89)	156 (46.15)	182 (53.85)	1250 (100.0)

Note: Percentages are in parentheses.

A power analysis, conducted using G*Power assessed the representativeness of the sample. The objective was to determine the sample size necessary to detect a medium effect size (0.25), with a desired power of 0.80 at a significance level of 0.05 for a one-way ANOVA omnibus test with three groups. The results (see Figure 1) indicate that a minimum sample of 156 respondents is required to achieve 80% confidence in accurately rejecting or accepting the null hypothesis. Given that our sample of 1250 respondents is eight times larger than the minimum requirement, this sample is deemed sufficient.

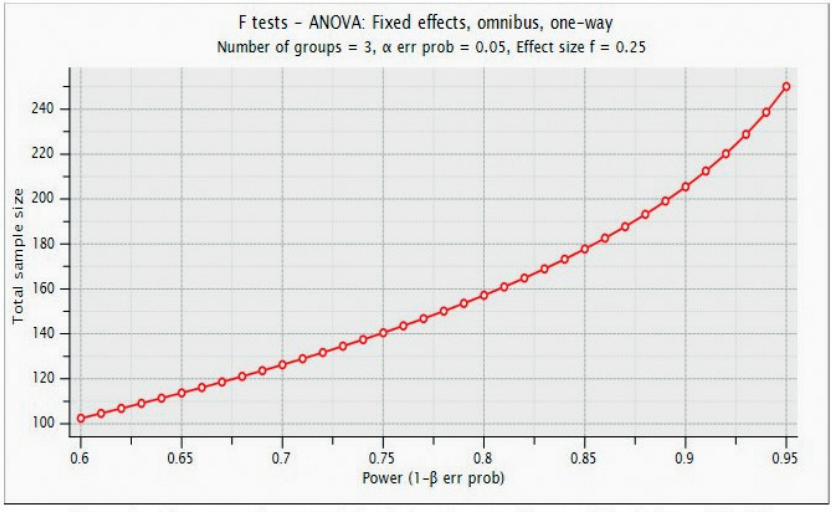

Fig. 1. Power analysis results showing the sample size requirements for different effect sizes

Instrumentation

The Student Opinion Questionnaire (SOQ) was developed as a data collection tool with expert input and guided by a literature review. Its creation addressed the absence of a suitable instrument tailored to the study's context in Cross River State, Nigeria, aiming to ensure data relevance, validity, and reliability. Rather than using existing instruments, a tailored design was preferred to avoid potential inaccuracies and ensure alignment with the study's objectives. The questionnaire consisted of four sections — A, B, C, and D. Demographic data, including class and school type, were collected in Part A. Part B featured ten 4-point Likert-type scales measuring home religiosity and assessing the frequency of observed behaviours. Respondents indicated the frequency with which they observed each behaviour, with response options ranging from «frequent» to «never.» Some sample items in this section include "*my family engages in religious practices (e.g., prayer, meditation) together at home*", "*religious symbols and artefacts (e.g., scriptures, religious decorations) are displayed in my home*", "*I feel a sense of belonging to a religious community within my family*" and "*discussions about religious beliefs and values are held in my household.*"

Part C consisted of ten items designed to measure home behaviour control. This section presented scenarios likely to occur in the home, and respondents were asked to indicate how their parents would react to each scenario from three available options. The respondents' answers across the ten items classified their home behaviour control as stern, firm, or lax. Part D comprised twenty 4-point Likert-type items evaluating indiscipline behaviour, categorised into five subscales. The first subscale evaluated personal indiscipline behaviour, including rudeness and disobedience. The second subscale assessed students' involvement in legal indiscipline, such as cheating and fighting. The third subscale gauged moral indiscipline behaviour, such as sexual offences and deceit. The fourth subscale examined students' safety-related indiscipline behaviour, encompassing bullying, smoking, and similar actions. Finally, the fifth dimension evaluated indiscipline in education, such as truancy and class skipping.

Validity and reliability

Six experts (three in educational psychology and three in tests and measurements) reviewed preliminary versions of the SOQ. Face validity was ensured through a surface-level evaluation of the questionnaire's content to confirm that the scales accurately measured their intended constructs. The experts meticulously scrutinised the research instrument, eliminating unclear or ambiguous items and replacing them with more appropriate items. Quantitative content validity analysis determined the level of agreement among experts and the average proportion of expert responses regarding each item's clarity and relevance. The analysis produced acceptable values for the items, with item content validity indices (I-CVIs) ranging from 0.71 to 0.99 for clarity and from 0.74 to 0.99 for relevance. Three items with I-CVIs less than 0.80 were revised for clarity, relevance, or both. The scale content validity indices for clarity and relevance ranged from 0.92 to 0.95 and 0.90 to 0.97, respectively. Following revisions to the three items with weak I-CVIs, the final version of the instrument was compiled. The researchers piloted the Students' Opinion Questionnaire (SOQ) to gauge its reliability. They employed the instrument with 100 senior secondary I and II students from nonparticipating schools in the research area. Two weeks later, the same students completed the questionnaire again. The researchers analysed the data from both administrations and conducted a correlation analysis to assess the test-retest reliability of the questionnaire scales. The results indicated acceptable reliability, with coefficients ranging from 0.56 to 0.91.

Ethical considerations

Ethical clearance was not mandated for this study per national and institutional regulations. The Nigerian Code of Health Research Ethics exempts survey-based studies from such clearance. Despite this exemption, the researchers took measures to ensure the participants' well-being, safeguarding against physical, emo-

tional, or psychological harm. Written informed consent was obtained from all participants prior to their inclusion in the study. Participants were informed of the study's objectives, their right to withdraw, potential risks and benefits of participation. The participants were assured of the privacy and the confidentiality of their personal information. The selection process was fair and devoid of discrimination against individuals or groups.

Data collection and analysis

The researchers visited each of the 30 selected secondary schools and, upon obtaining permission from the principal in each case, convened the respondents in a classroom with the assistance of teachers to administer the instrument. The researchers thoroughly explained the expectations to the students before distributing a copy of the questionnaire to each student, ensuring the retrieval of all the completed questionnaires. Due to the respondents' careful and mature handling of the instruments, there were no instances of attrition, resulting in a 100% retrieval rate of the administered instruments. A one-way analysis of variance was performed to test all the hypotheses at the 0.05 level of significance.

Results

Normality test

A normality test was conducted to assess the suitability of the parametric tests, considering associated assumptions. All variables' normality was evaluated using skewness, kurtosis, the Shapiro—Wilk test, histograms, and Q—Q plots. The results in Table 2 indicate that all the variables were normally distributed. Skewness and kurtosis values are close to zero, suggesting approximately symmetric distributions with minimal tail weighting. However, home religiosity shows negative kurtosis, indicating a flatter distribution, while the personal dimension of indiscipline behaviour exhibits positive kurtosis, suggesting a slightly more peaked shape. Additionally, the p values of the Shapiro-Wilk normality test exceeded 0.05 for all the variables, indicating an approximately normal distribution.

After reviewing Figures 2 and 3, the data for this study's independent and dependent variables appeared normally distributed. The histograms in Figure 1 exhibit a bell-like shape, which indicates approximately normal distributions for all variables. Similarly, the Q—Q plots in Figure 3 demonstrate a nearly straight pattern for the data, further suggesting normality for each variable. Therefore, the evidence suggests that the data may be normally distributed for this study.

Hypothesis 1

This hypothesis investigated whether home behaviour control significantly influences students' indiscipline behaviour in school. We performed a one-way analysis of variance (ANOVA)

Table 2

Descriptive statistics and normality tests for the variables in this study

Variables	HBC	HR	PD	LD	MD	SD	ED	OIB
Mean	30.92	29.38	10.98	10.10	10.50	9.72	10.69	52.00
Std. Deviation	3.37	3.86	4.91	4.93	4.36	4.13	3.80	19.91
IQR	4.59	5.34	6.55	6.79	5.65	5.59	5.03	26.02
Skewness	0.01	–0.04	–0.16	0.00	–0.02	0.00	0.03	0.06
SE of Skewness	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07
Kurtosis	–0.03	–0.24	0.05	–0.20	–0.01	–0.03	–0.05	–0.08
S.E. of Kurtosis	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14
Shapiro-Wilk	1.00	0.89	0.95	0.85	0.76	0.99	0.87	0.69
P value of Shapiro-Wilk	0.99	0.39	0.11	0.65	0.93	0.95	0.82	0.51

Note: HBC = Home behaviour control; HR = Home religiosity; PD = Personal dimension; LD = Legal dimension; MD = Moral dimension; SD = Safety dimension; ED = Educational dimension; OID = Overall indiscipline behaviour.

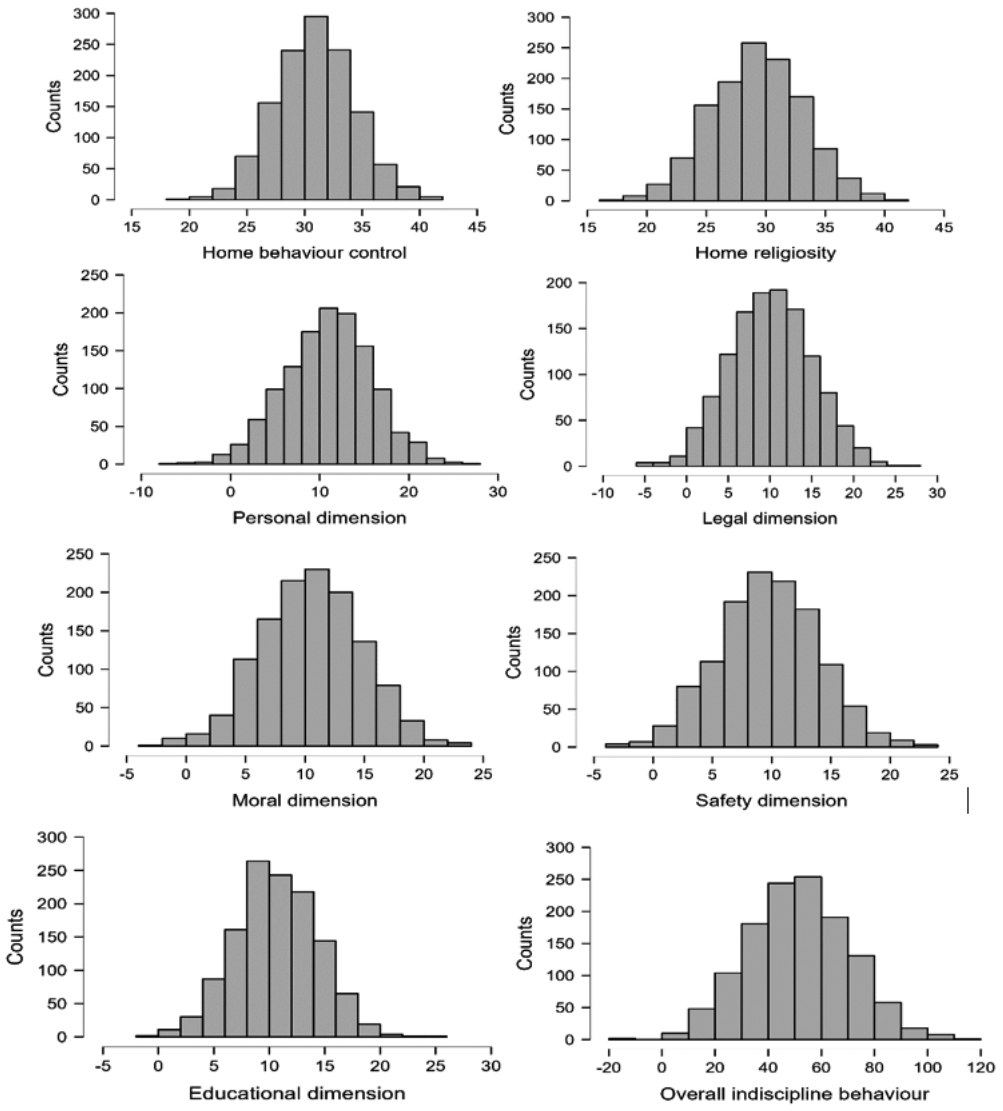

Fig. 2. Histograms showing the normality distributions of the variables

comparing these groups across five dimensions of indiscipline behaviour: personal, legal, moral, safety, and educational. The results, detailed in Tables 3 and 4, indicate that indiscipline levels were highest among students from homes with lax behaviour control. In contrast, lower levels were observed in those with stern and firm behaviour control. This trend remained consistent across all dimensions assessed.

Table 4 shows that the calculated F value for each dimension of indiscipline behaviour was greater than the critical F value of 3.00 at the 0.05 significance level, with 2 and 1247 degrees of freedom. These results rejected the null hypothesis,

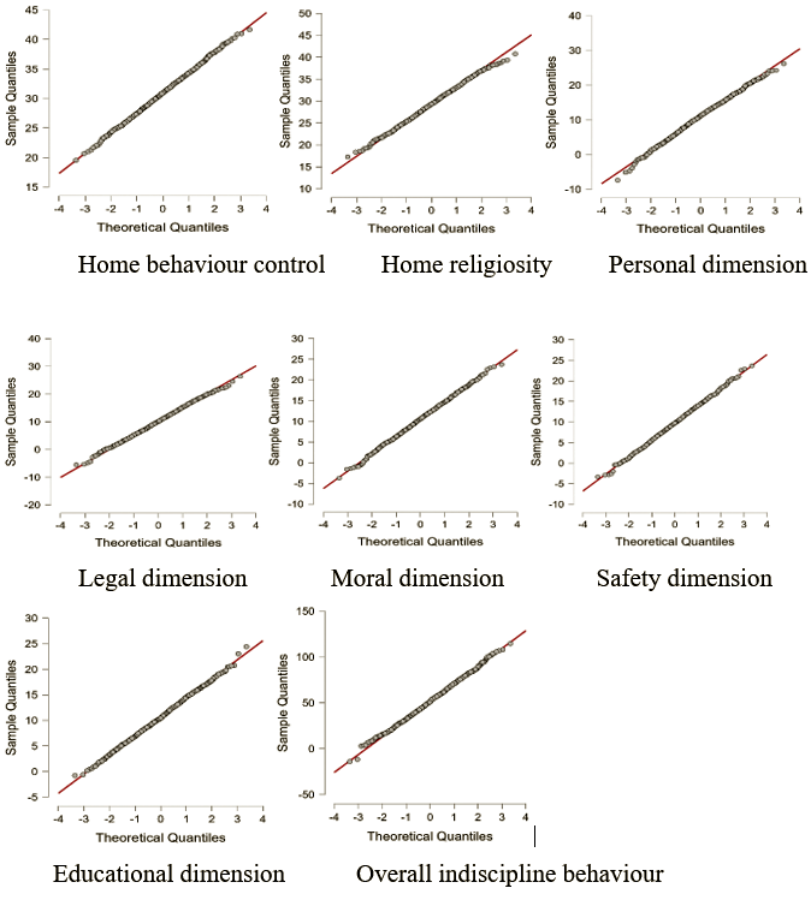

Fig. 3. Q–Q plots showing the normality of the distribution of the variables

Table 3

Group means and standard deviation of home behaviour control

Indiscipline	Home behaviour control	N	M	SD
Personal	Lax	496	13.99	3.00
	Stern	505	9.82	5.17
	Firm	249	7.33	3.85
	Total	1250	10.98	4.91
Legal	Lax	496	11.98	3.78
	Stern	505	10.04	5.62
	Firm	249	6.48	3.08
	Total	1250	10.10	4.93
Moral	Lax	496	13.09	3.23
	Stern	505	9.84	4.56
	Firm	249	6.67	1.80
	Total	1250	10.50	4.13

Indiscipline	Home behaviour control	N	M	SD
Safety	Lax	496	11.39	3.33
	Stern	505	9.76	4.62
	Firm	249	6.33	1.80
	Total	1250	9.72	4.13
Educational	Lax	496	12.57	2.19
	Stern	505	10.54	4.44
	Firm	249	7.25	2.07
	Total	1250	10.69	3.80
Total	Lax	496	63.02	10.67
	Stern	505	50.01	22.99
	Firm	249	34.08	11.04
	Total	1250	52.00	19.91

whereas the alternative hypothesis was upheld. Therefore, home behaviour control significantly influences students' overall indiscipline behaviour and the five dimensions of indiscipline behaviour.

We conducted Fisher's least significant difference (LSD) post hoc test to conduct multiple pairwise comparisons, addressing the limitation of the omnibus nature of ANOVA and identifying specific sources of variation. The LSD analysis results are summarised in Table 5 and indicate significant differences between groups for all dimensions and total indiscipline scores. Notably, all comparisons yielded p values less than 0.05, indicating statistical significance. The mean differences varied across dimensions, with students experiencing firm home behaviour control displaying lower indiscipline behaviour in school than those with lax home behaviour control across all dimensions. While differences between firm and stern home behaviour control were generally smaller, they remained statistically significant, suggesting that strict or stern home behaviour control may effectively deter indiscipline behaviour, particularly in dimensions such as legality.

Table 4

One-way analysis of variance (ANOVA) of the influence of home behaviour control on students' indiscipline behaviour in school (n = 1250)

Indiscipline	Source of variation	SS	Df	MS	F
Personal	Between groups	850.271	2	4250.635	245.348*
	Within group	21604.188	1247	17.325	
	Total	30105.459	1249		
Legal	Between groups	5024.886	2	2512.443	123.620*
	Within group	25344.007	1247	20.324	
	Total	30368.893	1249		
Moral	Between groups	7198.024	2	3599.012	271.925*
	Within group	16504.456	1247	13.235	
	Total	23702.480	1249		
Safety	Between groups	4225.261	2	2112.630	154.241*
	Within group	17080.071	1247	13.697	
	Total	21305.331	1249		
Educational	Between groups	4703.037	2	2351.519	219.386*
	Within group	13366.147	1247	10.719	
	Total	18069.185	1249		
Total	Between groups	142269.8	2	71134.905	251.306*
	Within group	352977.2	1247	283.061	
	Total	495247.0	1249		

Note: * Significant at the 0.05 level, critical F = 3.00, df = 2, 1247.

Table 5

Fishers' LSD test of multiple comparisons analysis of the influence of home behaviour control on students' indiscipline behaviour in school

Indiscipline	Home behaviour control		MD	SE	t	p
Personal dimension	Firm	Stern	4.17	1.10	14.18	.013
		Lax	6.66	1.09	18.43	.000
	Stern	Lax	2.49	1.55	6.91	.032
Legal dimension	Firm	Stern	4.16	1.29	14.87	.000
		Lax	7.72	1.28	22.47	.000
	Stern	Lax	3.56	1.82	10.40	.012
Moral dimension	Firm	Stern	4.46	0.84	19.60	.009
		Lax	7.63	0.83	27.29	.000
	Stern	Lax	3.17	1.18	11.36	.017
Safety dimension	Firm	Stern	4.63	0.68	24.13	.010
		Lax	8.15	0.67	34.51	.000
	Stern	Lax	3.51	0.96	14.92	.015
Education dimension	Firm	Stern	2.76	0.68	12.67	.026
		Lax	6.05	0.67	22.61	.000
	Stern	Lax	3.29	0.96	12.33	.021
Total indiscipline	Firm	Stern	13.01	15.93	13.01	.000
		Lax	28.94	15.79	25.93	.000
	Stern	Lax	15.93	22.49	15.93	.000

Hypothesis 2

This hypothesis examined whether home religiosity significantly influences students' indiscipline behaviour in school. The statistical technique employed was one-way analysis of variance (ANOVA), and the results are presented in Tables 6 and 7. Table 6 demonstrates that indiscipline behaviour is inversely correlated with home religiosity. Students from low-religiosity homes exhibited higher levels of indiscipline, followed by those from moderately religious homes and those from highly religious homes. Table 7 shows that the computed F values for each dimension of indiscipline behaviour exceeded the critical F value of 3.00 at the 0.05 significance level, with 2 and 1247 degrees of freedom. Consequently, the null hypothesis was rejected, indicating the significant influence of home religiosity on students' indiscipline behaviour in school.

Table 6

Group means and standard deviation of the variable for home religiosity

Indiscipline	Home Religiosity	N	M	SD
Personal	Low	268	15.00	1.54
	Moderate	278	12.39	4.19
	High	704	8.89	4.86
	Total	1250	10.98	4.91
Legal	Low	268	11.17	1.75
	Moderate	278	10.72	4.01
	High	704	9.45	5.89
	Total	1250	10.10	4.93
Moral	Low	268	12.23	2.28

Indiscipline	Home Religiosity	N	M	SD
	Moderate	278	12.06	4.69
	High	704	9.23	4.40
	Total	1250	10.50	4.36
Safety	Low	268	11.73	3.02
	Moderate	278	11.47	3.71
	High	704	8.27	4.07
	Total	1250	9.72	4.13
Educational	Low	268	12.89	1.93
	Moderate	278	11.31	4.02
	High	704	9.61	3.84
	Total	1250	10.69	3.80
Total	Low	268	63.02	5.30
	Moderate	278	57.95	15.82
	High	704	45.46	22.18
	Total	1250	52.00	19.91

Table 7

One-way analysis of variance (ANOVA) of the influence of home religiosity on students' indiscipline behaviour at school (n=1250)

Indiscipline	Source of variation	SS	Df	MS	F
Personal	Between groups	7963.84	2	3981.92	224.26
	Within group	22141.62	1247	17.76	
	Total	30105.46	1249		
Legal	Between groups	707.785	2	353.89	14.88
	Within group	29661.11	1247	23.79	
	Total	30368.89	1249		
Moral	Between groups	2607.61	2	130.804	77.07
	Within group	21094.87	1247	16.916	
	Total	23702.48	1249		
Safety	Between groups	5407.83	2	1703.915	118.72
	Within group	17897.50	1247	16.916	
	Total	21305.33	1249		
Educational	Between groups	2226.97	2	1113.487	87.65
	Within group	15842.21	1247	12.704	
	Total	10869.16	1249		
Total	Between groups	72524.22	2	36262.111	106.97
	Within group	422722.80	1247	338.991	
	Total	495247.00	1249		

Note: * Significant at the 0.05 level, critical F=3.00, df=2,1247.

Further analysis of the factors' influence was conducted using Fisher's LSD multiple comparison analysis, and the results are detailed in Table 8. The table indicates that students with high levels of home religiosity tend to display significantly lower levels of indiscipline behaviour across all dimensions than do those with low or moderate levels of home religiosity. Significant differences in mean scores were observed between the low- and high-home religiosity groups for the personal, legal, moral, safety, and education dimensions, with total indiscipline scores yielding p values less than 0.05. Similarly, significant differences were found between the moderate and high home religiosity groups for the legal, moral, safety, and education dimensions, along with total indiscipline scores, with p values less than 0.05.

Table 8

Fisher's LSD multiple comparison analysis of the influence of home religiosity on students' indiscipline behaviour in school

Indiscipline	Home religiosity		MD	SE	t	p
Personal dimension	Low	Moderate	2.62	1.53	6.49	.036
		High	6.12	1.50	18.69	.000
	Moderate	High	3.50	0.94	10.49	.018
Legal dimension	Low	Moderate	4.55	2.05	10.94	.013
		High	5.82	2.01	16.69	.003
	Moderate	High	1.27	1.27	3.69	.048
Moral dimension	Low	Moderate	2.40	1.46	5.66	.041
		High	5.23	1.43	14.72	.008
	Moderate	High	2.83	0.90	8.08	.028
Safety dimension	Low	Moderate	6.12	1.24	34.20	.000
		High	9.32	1.22	62.12	.000
	Moderate	High	3.20	0.76	21.61	.022
Education dimension	Low	Moderate	2.93	1.10	8.25	.024
		High	4.63	1.08	15.56	.011
	Moderate	High	1.70	0.68	5.79	.042
Total indiscipline	Low	Moderate	5.67	29.24	5.67	.007
		High	18.18	28.71	18.18	.000
	Moderate	High	12.79	18.04	12.79	.000

Discussion

The first finding indicates the significant influence of home behaviour control on students' indiscipline behaviour. The finding highlights that students from lax households display heightened levels of indiscipline, followed by those from stern homes, while students from firm households exhibit lower levels of indiscipline. This observation is consistent with role theory [7], which posits that individuals conform to the roles and expectations established within their immediate environment, including family and social networks. In lax households, unclear boundaries and expectations may result in students lacking behavioural structure and discipline. Conversely, overly stringent rules in stern households might provoke rebellious behaviour. However, students from firm households adhere to clear, consistent rules and expectations, leading to diminished indiscipline. These findings suggest collaborative efforts between teachers and parents to establish clear household rules and boundaries, fostering positive classroom behaviour. Strategies include setting consistent consequences for misbehaviour and encouraging parental monitoring. Educators can also engage students in discussions to underscore the significance of rules and boundaries in promoting positive behaviour and academic achievement. These findings are consistent with prior research demonstrating that adolescents from lax (Laissez-faire) family styles exhibit notably greater engagement in delinquent behaviour than do those from firm and stern households [6; 30; 47; 48]. They also align with Gittins and Hunt's [25] findings that indiscipline behaviour largely stems from home behaviour control, particularly when ideal practices are not implemented. However, they contrast with the results of [58], which suggest that home climate lacks a significant association with adolescent antisocial behaviour.

The second hypothesis reveals the significant influence of home religiosity on students' undisciplined behaviour. Specifically, students from households with low religiosity exhibited heightened undisciplined behaviour, while those from highly religious homes displayed lower levels.

This observation underscores the pivotal role of home religiosity in shaping students' behaviour, with high religiosity linked to reduced undisciplined behaviour and vice versa. This outcome aligns with role theory principles, suggesting that individuals tend to conform to roles and expectations within their immediate environments, such as family and social networks [16]. One plausible explanation for this association is that religious beliefs and practices provide individuals with a sense of structure and discipline. For instance, religious teachings often emphasise moral values and ethical conduct, guiding individuals in decision-making and behaviour aligned with societal norms. These findings suggest that educators can collaborate with parents to foster a robust religious foundation in the home, fostering positive behaviour in the classroom. Strategies include encouraging parents to involve their children in religious activities such as attending services, praying, or meditating. Similarly, Nnadozie et al. [41] reported that adolescents with highly or moderately religious parents were less likely to engage in premarital sex than were those with low-home religiosity, indicating a correlation between religiosity and disciplinary behaviour.

Limitations and Prospective Research Directions

This study's findings on parenting styles and their impact on students' indiscipline have significant implications, yet several limitations affect the generalizability of the results. First, the subjective nature of the outcome variable, indiscipline behaviour, may introduce biases. Future research could employ multiple measures, including observations and self-reports, to enhance reliability and validity. Objective measures such as physiological assessments could offer more precise evaluations. Second, the sample's lack of representativeness may restrict generalizability. Diversifying participants and conducting multisite studies across different cultures could provide broader insights. Third, inadequate control over extraneous variables may compromise internal validity. Future studies could employ rigorous designs, such as randomised controlled trials, and consider potential confounding variables in analyses. Finally, the cross-sectional design limits causal conclusions. Longitudinal designs and experimental manipulations of home behaviour control are suggested for exploring causal pathways.

Conclusion

This study aimed to assess the impacts of home behaviour control and religiosity on student indiscipline. We found significant influences of both factors on student behaviour, consistent with role theory, which posits that immediate social surroundings influence behaviour. Specifically, students from firm homes and high religiosity levels displayed lower indiscipline, contrasting with those from lax homes and low religiosity levels, who showed higher levels of indiscipline. These findings have implications for policy, research, and practice. Policymakers can develop programs promoting positive behaviour by fostering a strong religious foundation at home and establishing clear behaviour expectations. Researchers can further explore the social environment's role in behaviour formation and underlying mechanisms. Educators can collaborate with parents to set clear behaviour rules and encourage religious practices, fostering positive classroom behaviour. Understanding the social environment's influence aids in promoting positive student behaviour and academic success.

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Study of Teachers' Participation in Mentoring Activities in schools (using the example of St. Petersburg)

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The article is devoted to the study of the motivation and readiness of teachers to implement the target model of mentoring in order to identify and evaluate the factors influencing this process. We considered theoretical foundations of the organization of mentoring, possible approaches to the study of strategies for the behaviour of teachers during its implementation, and gave the characteristics of their manifestations. The results of study were obtained on a sample of teachers from 4 secondary schools in one of the districts of Saint Petersburg. We used the methods "Motivational profile", "Determination of the motives of teachers' work activity", "Motivational readiness of the teaching staff to master innovations", "Barriers preventing the development of innovations", based on generally accepted methodology, proven research design, methods of data collection and analysis, which minimize the impact of systematic and random errors, reduce the reliability of the data. The results obtained show that teachers from different schools have similar characteristics of readiness for mentoring activities, which is largely determined by the level of motivation of teachers, the nature of their attitude towards mentoring, and the degree of understanding of its necessity and importance.

Keywords: mentoring; mentoring activities; motivation; willingness to mentor.

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Исследование мотивации педагогов к наставнической деятельности в школах (на примере Санкт-Петербурга)

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Статья посвящена исследованию мотивации и готовности педагогов к реализации целевой модели наставничества, выявлению влияющих на этот процесс факторов. Рассмотрены теоретические основы организации наставничества, возможные подходы к изучению стратегий поведения педагогов при его внедрении, даны характеристики их проявлений. Представлены результаты исследования, полученные на выборке педагогов 4 общеобразовательных школ одного из районов Санкт-Петербурга. Использовались методики «Мотивационный профиль», «Определение мотивов трудовой деятельности педагогов», «Мотивационная готовность педагогического коллектива к освоению новшеств», «Барьеры, препятствующие освоению инноваций», базирующиеся на общепринятой методологии, апробированном дизайне исследования, методах сбора и анализа данных, что минимизирует влияние систематических и случайных ошибок, обеспечивает достоверность данных. Полученные результаты показывают, что учителя разных школ имеют схожие характеристики готовности к наставнической деятельности, которая в наибольшей степени определяется уровнем мотивации педагогов к ней, характером отношения к наставничеству, степенью понимания его необходимости и важности.

Ключевые слова: наставничество; наставническая деятельность; мотивация; готовность к наставнической деятельности.

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Introduction

The changes taking place in society and in education have affected the requirements for teaching staff. The implementation of the 21st century teacher model involves the formation of a highly professional, competent, creatively active personality with a dominance of spiritual and moral qualities [19]. In solving this problem, the institution of mentoring is of utmost importance.

Mentoring is a historically popular and proven mechanism for young specialists to enter professional activities, an effective tool for their accompaniment and support, development of their competence, and one of the ways to master and transmit innovative teaching practices [29]. The growth of research and practical interest in mentoring problems is facilitated by the work to create a methodology for a targeted mentoring model within the framework of the federal projects "Modern School", "Young Professionals", "The Success of Every Child", which consider mentoring in a broad social context [13; 35].

The organization of mentoring in a modern school faces a number of problems. Firstly, the effectiveness of accompaniment and support of a novice teacher by a teacher-mentor is difficult to measure and is not obvious due to the difficulty of differentiating and assessing the contribution of the mentor and mentee to the professional development of a novice teacher [32]. Secondly, young specialists are not always ready to follow the recommendations of senior colleagues, and not every experienced teacher is ready and able to share professional experience, including due to its insufficient comprehension and systematization [37]. Finally, successful mentoring practices do not always become the subject of research, study, mass dissemination and adoption [25].

The above actualizes research on mentoring as a tool for managing the professional development of teachers [33].

Methodology and methods

Models of professional development of a teacher and the actualization of his creative potential are analyzed in the works of T.V. Gavrutenko [4], M.V. Druzhinina, A.N. Zagorodnyuk, T.V. Kudryavtseva, Ya.A. Ponomareva, I.V. Strakhov. The essential characteristics and structure of mentoring as an effective tool for professional development are described in the works of E.A. Dudina [6], L.A. Mokretsova, N.V. Sharapova, a number of foreign authors [27; 30]. Ways of forming teachers' motivation for professional development and self-development, stimulating their pedagogical creativity in the context of mentoring activities are studied by A.N. Bubnova, O.G. Davydova, I.L. Pronkina, N.Yu. Sinyagina.

Theoretical models of mentorship are presented in the works of S.G. Antipina [1], N.A. Bykova, T.V. Dyachkova, S.I. Pozdeeva, A.Yu. Pomogaibina, Yu.A. Snegireva, M.A. Fedulova, E.I. Chuchkalova and others. Issues of managing the development of mentoring at school are explored in the articles by Yu.V. Gavrusheva [5], N.P. Ivanova, M.E. Ledovskoy, I.V. Rozdolskaya and others. The works of S.A. are devoted to mentoring as activity support for young teachers. Barkova, N.L. Myslivets, S.I. Pozdeeva [16], S.N. Shcherbinina and others.

In the domestic literature, mentoring is predominantly viewed as:

— instrument for creating sustainable motivation for self-development [2; 7; 31];

— effective means of entering the profession [15; 36];

— method of professional socialization [8; 38];

— mechanism for supporting the professional growth of a young teacher [14; 22];

— technology of subject-subject interaction in the professional and pedagogical community [3; 10; 26];

— synergetic system of self-organization and self-realization of subjects of educational activities [9; 20; 39].

Foreign authors (G. Lewis, D. Megginson, L. Rai, etc.) correlate mentoring with human resource management activities. Thus, L. Rai defines mentoring as "the most successful method of skill transfer" [17]. Mentoring according to G. Lewis is "a system of relationships for the purpose of gaining experience in the workplace" [11]. D. Megginson considers mentoring as a way to assist an employee in building his professional career, adequately assessing his capabilities and mobilizing existing potential [24], D. Clutterbuck speaks of "combining the role of a parent and peer, consulting, coaching and facilitation by a mentor" [28].

Foreign experience in organizing mentoring is associated with the search for effective ways to transfer experience and skills within the framework of a specially formed support system for a young specialist, called "mentoring", the main principles of which are the authority of the mentor, mutual trust and equality of the mentor and the mentee, a friendly atmosphere, and interested participation. In this interpretation, mentoring tasks are formulated as:

— facilitation of a young teacher's entry into the professional environment;

— ensuring the teacher's socialization in a new environment;

— support and consolidation of successful experience;

— encouraging all participants in the process to interact creatively [12; 34].

Both Russian and foreign researchers agree in recognizing the importance of the problem of motivation for mentoring activities of both the mentor and the mentee. The analysis of publications on this topic showed that the greatest interest is in issues of understanding and recognizing the importance of mentoring, attitudes towards it, and the formation of appropriate behavior patterns. The results of studying the works of Russian and foreign researchers suggest that the frequently mentioned motivations for mentoring include (Table 1):

Table 1

Typology of motives for mentoring activities *

№	Name of the motive	Content
1.	Need for self-realization and recognition	The desire to acquire a certain social status, professional and public recognition, increasing satisfaction with the results of one's own work
2.	Need for authentication with a significant person	The desire to be like an authoritative person, gaining and strengthening personal authority
3.	Need for leadership (authority)	The desire to occupy a leadership position, expand power, gain the opportunity to influence the activities of other people, control and evaluate their actions and actions
4.	Need for activity	The desire for more active participation in the processes of the organization, socially significant activities, and an increase in contribution to the overall result
5.	Need for positive reinforcement	The desire to receive benefits determined by the position (prestige, material incentives, benefits, etc.)

№	Name of the motive	Content
6.	Need for self-improvement	The desire to improve one's own competence, professional growth, and mastery
7.	Need for success	The desire to achieve significant performance results, leadership, and setting ambitious goals
8.	Need to avoid failure	The desire to avoid causing displeasure and criticism from management, to avoid punishment, deprivation of privileges, etc.
9.	Need for communication and emotional contacts	The desire to establish and maintain constructive relationships with other people and interpersonal interaction
10.	Sense of duty and responsibility	The desire to conscientiously carry out assigned work, perfectionism, and a high level of social responsibility

*Legend. ** — applies to both mentors and mentees.

A characteristic of mentoring activity is the readiness of teachers for it, both mentors and mentees. In our opinion, mentoring activities should not be initiated at all if teachers are unprepared for it, since there is a risk that in this case mentoring will be carried out formally or supported solely on the basis of strict administration.

The interpretation of the concept of "readiness for mentoring activities" is based on two main approaches: subjective and operational-activity. In the first of them (M.I. Dyachenko, L.A. Kandybovich, B.G. Ananyev, V.A. Krutetsky, V.D. Shadrikov, A.A. Derkach, etc.), the teacher's readiness for mentoring is conceptualized as actualization of his basic values, attitudes, needs and is expressed through a system of professional and personal qualities, subjective perception of the importance of this process and the significance of its results. The second approach (F. Genov, E.P. Ilyin, N.D. Levitov, L.S. Nersesyan, V.N. Pushkin, D.N. Uznadze, A.Ts. Puni, etc.) defines readiness from the standpoint the operational structure of mentoring activities, the teacher's clear understanding of the algorithm and the relevant competencies for its implementation. In our opinion, it is not the opposition of these approaches that is productive, but their integration into a holistic model of developing a teacher's readiness for mentoring activities.

By analogy with the research of V.A. Slastenin and L.S. Podymova can talk about the reflexive, cognitive, technological, motivational components of readiness for mentoring [21].

The reflective component of readiness is associated with comprehension, awareness of the needs, expectations, goals of mentoring, understanding of one's own capabilities, accumulated professional experience, and readiness to transfer it. Reflection creates conditions for self-improvement and self-realization of the mentor and mentee.

The cognitive component as a set of subject and psychological-pedagogical knowledge, mastery of methods of translating methodological systems and pedagogical experience creates the basis for the formation of specific content and technologies of mentoring activities.

The technological component is associated with the direct implementation of mentoring, with the ability to develop and implement its various models, analyze problems and one's own capabilities to resolve them, formulate goals, methods, and means of mentoring activities, predict its results, carry out control and correction.

The most important component in the structure of readiness for mentoring is *the motivational component*, reflecting a stable need for it; the desire to change one's position and active participation in the educational process, awareness of the need to enrich professional activities. These needs are the leading motivations for participation in mentoring activities.

Similar readiness structures are represented by O.A. Beketova, I. Dernovsky, T.D. Kuranova, N.S. Ponomareva, T.A. Prishchepa, S.A. Trifonova, G.N. Fomitskaya, T.S. Bazarov, denoting knowledge, emotional and activity components [23].

The objectives of the study were to establish the structure of teachers' motives that determine their readiness for mentoring activities, assess the significance of factors influencing the motivational and other (cognitive, operational, emotional-volitional) components of readiness for mentoring activities, as well as to identify typical difficulties encountered teachers during its implementation. We proceeded from the assumption that, given the overall greatest importance of the motivational component of readiness, the structure of motives, modality and degree of influence of factors in specific schools may vary, which largely depends on the management of the educational organization.

136 teachers from 4 schools in one of the districts of St. Petersburg took part in the study, 34 teachers from each school with experience in mentoring activities. The age of teachers is 34—56 years old, 39% of them have the highest category, 43% have the first category, 18% have no category, 92% of the respondents were women.

Research results

The study was based on the well-known method of S. Ritchie and P. Martin "Motivational Profile" [18], which makes it possible not only to identify the motives that encourage teachers to mentoring activities or create barriers to it, but also to assess the degree of their expression.

The first question of the survey concerned teachers' understanding of the importance of mentoring for the development of the school and for them personally. 100% of respondents noted the high relevance and importance of mentoring for modern education. They included the following factors motivating mentoring activities (Table 2, Fig. 1).

Testing the hypothesis about the influence of the school on the structure of teachers'

Table 2

Factors encouraging mentoring activities

Motive code	Content of the motive	Number of choices (%)*			
		School 1	School 2	School 3	School 4
A	Need to be active	14,7%	8,7%	11,8%	14,7%
B	Need for professional recognition, achieving significant results	31,9%	14,7%	5,9%	20,6%
C	Need to improve school activities, increase personal contribution to the overall result	26,5%	17,4%	20,6%	26,5%
D	Need for a new type of activity, overcoming routine	5,9%	5,9%	14,7%	5,9%
E	Need to comprehend and systematize one's own teaching experience	11,8%	11,8%	11,8%	11,8%
F	Need for self-improvement and self-realization	17,4%	20,6%	23,2%	14,7%
G	Need for communication and emotional contacts	5,9%	0%	20,6%	11,8%
H	Need for additional benefits and privileges	20,6%	23,2%	2,9%	5,9%
I	Need for leadership (authority)	23,2%	20,6%	5,9%	2,9%
J	Commitment to improving the quality of education	8,7%	20,6%	11,8%	11,8%
K	Fear of the consequences of refusing to carry out instructions from management	0%	0%	5,9%	5,9%

*Legend. * —* the number of motives chosen by respondents was not limited. The percentage in the table reflects the share of 34 teachers from each school who chose the corresponding motive.

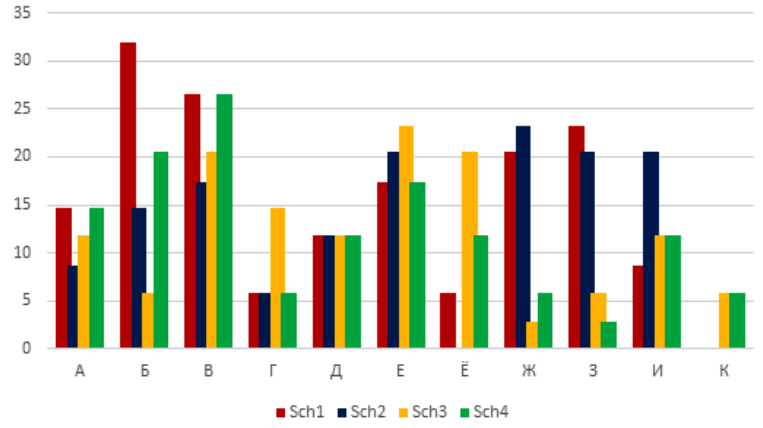

Fig. 1. Motives that encourage teachers to mentor activities

motivation for mentoring activities using the parametric Student's t-test for independent samples at a significance level of α=0.05 revealed the presence of statistically significant differences in all 4 groups of respondents. At the same time, the most significant influence on the motivation of teachers for mentoring activities is exerted not by external, but by internal factors (school management).

Figure 2 presents the motivational profiles of teachers in the schools studied.

In *School 1* there are noticeable disproportions in the motivational profile, high ratings of the importance of some factors with low ratings of others. Teachers are focused on administrative (including material) support, professional and public recognition, and consider mentoring as an effective way to improve

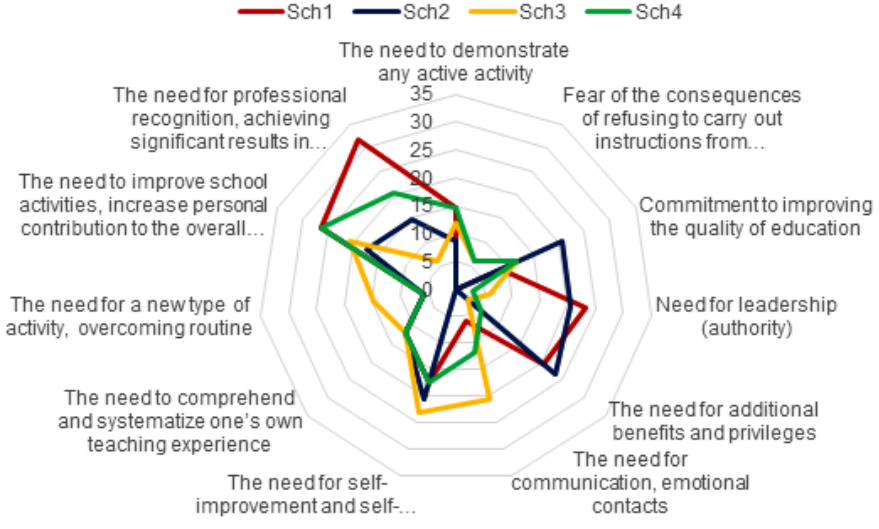

Fig. 2. Motivational profile of the studied schools

school activities. In general, the teaching staff is ready to introduce mentoring, provided that it is carried out purposefully, according to a well-thought-out plan, without external pressure and formalism, with sufficient resources and taking into account the capabilities of the school.

Teachers at *School 2* have a desire for professional and social recognition with a low level of need to systematize teaching experience and improve the school's activities. They are characterized by a lack of desire to set ambitious goals and solve complex problems. The leading motive for participation in mentoring activities is the desire to receive decent payment for performing additional duties.

For teachers at *School 3* relationships within the teaching staff, a favorable psychological climate, and comfortable working conditions are important. There is a willingness to innovate and to participate in experimental work. The team is aimed at self-improvement, professional growth, the opportunity to express themselves and improve the image of the school. Material incentives for mentoring activities are not of decisive importance.

School 4 shows the greatest variety of motives. What is more important for teachers is not remuneration, but involvement in the affairs of the school, openness of the administration and constant information, support for initiatives and recognition of achievements. They consider mentoring not only a necessary condition for professional growth, but also interesting and socially significant work.

To assess readiness for mentoring activities, the tested tools proposed by S.A. Trifonova seem to be quite relevant [20].

The following indicators for assessing readiness were named by respondents (Table 3).

Next, the degree of importance for respondents of the readiness components was determined (Table 4).

Table 3

Indicators of teachers' readiness for mentoring activity

Components	Indicators
Motivational	Interest in mentoring
	Satisfaction with the process and results of mentoring
	The need for self-improvement and self-growth
Emotional-volitional	Persistence in achieving the desired result
	Accepting responsibility and risk
	The ability to control your feelings and emotions
	Creating a welcoming atmosphere and interested participation
Operational	The ability to plan and conduct a pedagogical experiment
	The ability to assess the effectiveness of mentoring activities
	The ability to work in an electronic educational environment, develop innovative educational technologies
	The ability to create modern educational resources using the methodological potential of mentoring
	The ability to replicate best pedagogical experience taking into account the conditions of the educational institution
Cognitive	Knowledge of the fundamentals of psychology and pedagogy
	Experience in teaching disciplines
	Proficiency in pedagogical research methods
	Knowledge of the basics and experience of mentoring

Table 4

Assessing the importance of mentoring components

Components	Number of choices (%)
Motivational	52,9
Emotional-volitional	22,8
Operational	15,4
Cognitive	8,9
Total:	100

The survey showed that respondents, regardless of the degree of their activity in mentoring activities, consider the motivational component to be the most significant (52,9% of choices). The respondents justify the importance of the operational component by the need to expand opportunities and awareness of the choice of pedagogically appropriate technologies for solving professional and pedagogical problems, as well as the importance of developing competencies in planning and conducting pedagogical experiments, replicating advanced pedagogical experience, etc. Only 8,9% of respondents indicated the importance of the cognitive component, which reflects the common misconception among school management that mentoring activities do not require special training.

The assessment of teachers' readiness for mentoring activities was carried out by analogy with the methodology of T.S. Solovyova "Determination of the level of innovation of teachers in the school community", which makes it possible to differentiate teachers by type of attitude to activity (Figure 3).

"Group A" includes 13,75% of respondents who noted that they are passionate about the idea of mentoring, often act as mentors themselves and on their own initiative, and are ready to actively participate in the development and implementation of innovative mentoring models in their school.

The majority of respondents (66,25%) belong to "Group B"; they recognize the need and importance of mentoring, consider it a natural process for improving school activities and express their readiness to participate in its implementation. Teachers in this group show interest in mentoring, but believe that for its success it is necessary to create conditions and persistence of management, they are ready to participate in it with competent organization, clear setting of tasks and definition of responsibilities.

"Group C" includes 17,5% of respondents who are reserved about mentoring, do not express a desire to become mentors, but are also not ready to decisively refuse such an offer from management. They tend to be cautious in their judgments and assessments, but do not express an openly critical attitude towards mentoring and skepticism about the prospects for its implementation.

"Group D" (2,5%) doubts the feasibility and effectiveness of mentoring. As a rule, such teachers prefer to work "the old-fash-

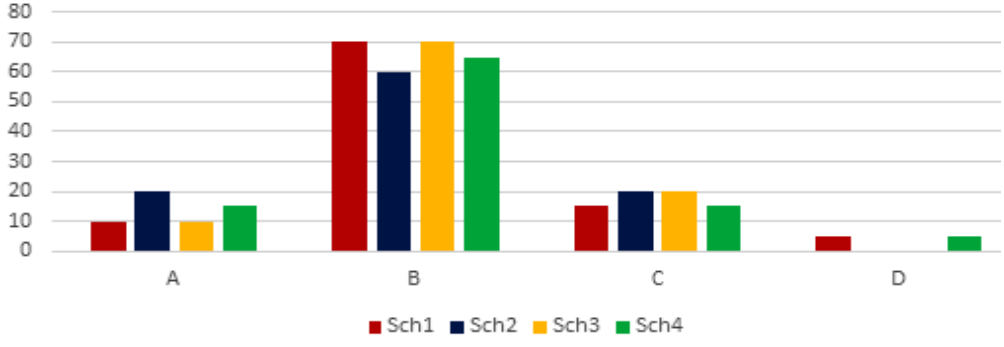

Fig. 3. Groups of teachers in relation to mentoring activities

ioned way" and do not want to leave their "comfort zone."

None of the teachers surveyed were included in "Group E," those who categorically do not want to take part in mentoring activities, who have a low assessment of its potential and effectiveness, or who have a negative attitude towards its implementation.

An analysis of the difficulties that impede teachers' involvement in mentoring activities was carried out using the author's methodology "Identification of teachers' difficulties in carrying out mentoring activities" (Table 5).

Respondents noted that financial support measures at the initial stage of implementing the targeted mentoring model were minimal due to the lack of formalization of the functionality and responsibility of mentors. This work was organized through the most active and motivated teachers who took on the main load; they were also involved in the direct organization of the process: the development of local documents and report templates, the identification of pairs taking into account the personal characteristics and interests of the participants, the distribution of responsibilities, delegation of authority, etc. Representatives of all schools noted that when implementing the targeted mentoring model, they felt the interest and support of the school administration; after documentation and consolidation of the status, mentors were regularly paid bonuses and incentives. Respondents drew attention to administrative support for initiatives for the participation of mentors and mentees in various competitions, conferences, seminars and other events significant for the school.

Discussion and conclusions

The paradigm shift in modern pedagogy dictates the need to rethink and scientifically substantiate the phenomenon of mentoring in its modern interpretation. The success of education modernization will largely be determined by the competence and authority of teacher-mentors, the level of their methodological skills, their readiness to comprehend

Table 5

Difficulties preventing teachers from getting involved in mentoring activities

Characteristics of activities causing difficulties	Number of choices (%)
Inability to generalize and systematize one's own teaching experience	92
Lack of mastery of mentoring techniques	89,3
Formalism when introducing mentoring, increased reporting, lack of incentives	89,3
Poor organization of mentoring, lack of clear definition of functions and powers, low awareness	89,3
Preparing mentees to participate in competitions	83,9
Difficulty adapting to changes in the content and conditions of activity, fear of new activities	83,9
Difficulty in activating the professional activities of mentees, their lack of interest	81,2
Heavy workload, lack of time, lack of self-organization skills	78,5
Lack of experience in conducting scientific and pedagogical research, organizing research activities of mentees	75,8
Professional and personal self-improvement in the process of mentoring activities	70,4
Difficulties in communicating with mentees	59,6
Inability to interact with the professional community	54,2
Poor knowledge of the academic subject and methods of teaching it by mentees	51,5
Difficulties in using information technology	48,8
Inability to predict potential difficulties for mentees. Adapting mentoring content to the interests and needs of the mentees	43,4

and transmit the best pedagogical practices, which requires the creation of a targeted and comprehensive system for training mentors. The condition for the success of mentoring is the motivation and positive attitude of mentors and mentees towards it, understanding the role of mentoring in the professional formation and development of a modern teacher.

By analyzing the practice of organizing mentoring in the schools under study, it is possible to differentiate the role models of participants in mentoring activities depending on their chosen behavioral strategies.

1. Proactive development of content, forms and methods of mentoring activities and their active implementation, readiness for a significant investment of time and effort. According to our research, this strategy is implemented by 1—2% of mentor teachers.

2. Amateur activity in mentoring activities is a behavioral strategy that presupposes explicit support by the teacher for the institution of mentoring and interested participation in its implementation. This model of behavior is followed by about 10% of teacher-mentors.

3. Demonstrative activity under pressure from management, teaching staff and/or circumstances. This strategy consists of formally performing the functions of a mentor with a moderate degree of activity, which may completely disappear when difficulties arise. This strategy is followed by the largest — 60—65% — group of teacher-mentors.

4. Passive mentoring. Characterizes the strategy of avoiding direct participation in mentoring activities, discussing its content and organizational forms, and unwillingness to accept the responsibility associated with mentoring. The share of such teachers is estimated at approximately 20%.

5. Active resistance to the introduction of mentoring, manifested in various forms: its criticism as unnecessary, ineffective and even harmful; accusing active mentors of selfish motives; in appealing to previous successful experience in the absence of mentoring; in actions that complicate the process of introducing mentoring or are directly directed against it. This position, according to the study, is occupied by 4—5% of teachers.

The data obtained on the readiness of teachers for mentoring activities and the leading motives for participation in it indicate insufficiently conscious work of school leaders to create positive motivation for mentoring, poor knowledge of the motives that encourage teachers to be active, and ways of updating them. It is significant that 100% of the teachers who took part in the study note the importance of mentoring for modern education and recognize the need for its competent organization, and generally have a positive attitude towards mentoring, provided that it is purposefully and thoughtfully implemented with sufficient resources and taking into account the capabilities of the school. More than 50% of respondents consider motivational readiness for mentoring activities to be the main factor in its success. The motivations of teachers to participate in mentoring activities have significant differences and are determined by various factors that reflect the specifics of schools. This means that given the general conceptual framework, there is not and cannot be a universal model and universal technology for introducing mentoring; the system will be viable and effective only if it is designed and implemented taking into account the conditions and characteristics of a particular school and with the active participation of teachers working there. In this regard, it's recommended to continue research of the correlation between teachers' readiness for mentoring activities and intra-organizational factors (management models and management style), the degree of support for this activity by management, the level of organizational culture, resource and methodological support, etc., as well as the impact of teachers' readiness for mentoring activities on its performance, level of success and achievements of the school.

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Features of Psychological Defenses and Coping Strategies among Teachers of Preschool Educational Institutions with Different Levels of Psychological Well-being

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The aim of the work was to identify the features of psychological defenses and coping strategies among teachers of preschool educational institutions with different levels of psychological well-being. The study involved 62 educators of preschool educational institutions in the city of Rostov-on-Don, the city of Aksai and the village of Rassvet, Rostov Region. The following methods were used: "Scale of psychological well-being" by K. Riff, technique for measuring psychological defense by E.R. Pilyugina, R.F. Suleimanov, questionnaire "Types of orientations in difficult situations" by E.V. Bityutskaya, A.A. Korneeva. As a result of the study, it was found that teachers with a high level of psychological well-being more often use adaptive psychological defenses, teachers with an average level of psychological well-being more often use psychological defense of the infantile type, teachers with a low level of psychological well-being more often use psychological defense of the psychotic, as well as infantile and neurotic types. Teachers of preschool educational institutions with a high level of psychological well-being are distinguished by their preference for coping strategies related to the type "Orientation towards rapprochement, interaction with difficulty." Teachers of preschool educational institutions with an average and, especially, a low level of psychological well-being tend to be more inclined to use coping strategies related to the type "Orientation towards leaving and moving away from difficulties." It is recommended to use the results of the study in psychoprophylactic and psychocorrective work with preschool teachers.

Keywords: teachers of preschool educational institutions; psychological well-being; coping strategies; psychological defenses.

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Особенности психологических защит и копинг-стратегий у педагогов дошкольных образовательных учреждений с разным уровнем психологического благополучия

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Представлены материалы исследования, целью которого было выявление особенностей психологических защит и копинг-стратегий у педагогов дошкольных образовательных учреждений с разным уровнем психологического благополучия. Выборку составили 62 воспитателя дошкольных образовательных учреждений города Ростова-на-Дону, города Аксай и поселка Рассвет Ростовской области. Использовались следующие методики: «Шкала психологического благополучия» К. Рифф, методика измерения психологической защиты Е.Р. Пилюгиной, Р.Ф. Сулейманова, опросник «Типы ориентаций в трудных ситуациях» Е.В. Битюцкой, А.А. Корнеева. Полученные результаты показали, что педагоги с высоким уровнем психологического благополучия чаще применяют адаптивные психологические защиты, педагоги дошкольных образовательных учреждений со средним уровнем психологического благополучия чаще применяют психологическую защиту инфантильного типа, педагоги дошкольных образовательных учреждений с низким уровнем психологического благополучия чаще применяют психологическую защиту психотического, а также инфантильного и невротического типов. Делается вывод о том, что педагоги дошкольных образовательных учреждений с высоким уровнем психологического благополучия отличаются предпочтением копинг-стратегий, относящихся к типу «Ориентация на сближение, взаимодействия с трудностью». Педагоги дошкольных образовательных учреждений со средним и особенно с низким уровнем психологического благополучия склонны к большему применению копинг-стратегий, относящихся к типу «Ориентация на уход и удаление от трудности». Рекомендуется использовать результаты исследования в психопрофилактической и психокоррекционной работе с педагогами дошкольных образовательных учреждений.

Ключевые слова: педагоги дошкольных образовательных учреждений; психологическое благополучие; копинг-стратегии; психологические защиты.

Для цитаты: *Воробьева Е.В., Правдина Л.Р., Шевченко А.В.* Особенности психологических защит и копинг-стратегий у педагогов дошкольных образовательных учреждений с разным уровнем психологического благополучия // Психологическая наука и образование. 2024. Том 29. № 2. С. 112—125. DOI: https://doi.org/10.17759/pse.2024290208

Introduction

Interest in the problem of psychological well-being is growing all over the world, and studies have shown that psychological well-being includes components such as self-efficacy, life satisfaction, financial stability, emotional and physical health, and autonomy [3; 14; 22; 23; 32]. The PERMA model of well-being, developed by M. Seligman, contains components such as positive emotions, involvement (passion for one's work), relationships, meaning in life, and achievements [36]. Data from a large-scale Russian online study of the psychological well-being of teachers in preschool educational institutions using the adapted PERMA-Profiler questionnaire, constructed based on M. Seligman's model of psychological well-being, have been published. It has been shown that the level of psychological well-being of teachers of preschool educational institutions exceeds that for the control group and is higher when teachers have their own children and with increasing work experience [3].

Psychological well-being is closely related to a person's mental health, and the latter is understood primarily as the ability to adapt to social changes and self-realization [21; 33]. Particularly relevant is the issue of the health of teachers of preschool educational institutions, since they experience serious mental stress associated with changing requirements for the performance of work duties, conflict situations with students and their parents, responsibility for the life and health of children, and the need to master new technologies and methods. work, improve skills and solve difficult pedagogical problems [14; 15; 17; 33; 41]. A teacher of a preschool educational institution must strictly observe the implementation of routine tasks in a group of children, conduct classes with students in accordance with the requirements of educational standards, using computer and other modern technologies, know the legislation, legal aspects of the work of a teacher, regulatory documentation in the field of preschool education [3]. While psychological well-being is high, as measured by love of work and self-efficacy, a significant number of early childhood educators experience problems both psychologically (e.g., feeling stressed at work, depressive symptoms) and with regard to physical well-being [13; 28]. Meta-analysis showed that the morbidity level of teachers is influenced by psychosocial factors such as low social support, heavy professional workload, high noise levels, high demands to the quality of work [13; 17; 43]. Manifestations of anxiety and stress in the educational environment affect both teachers and their pupils of different age categories — from preschool children to students [15; 20; 26; 27; thirty]. In recent years, issues of the psychological well-being of teachers and their students, types of psychological defenses and coping behavior have been studied in the aspect of overcoming the restrictions imposed by the COVID-19 pandemic and climate change [6; 18; 24; 25; 29; 40].

There are contradictions: despite the high demands and workload on teachers of preschool educational institutions, society notes the low status of this profession and low wages. Such contradictions have a negative impact on the physical and psychological health of specialists, which reduces the level of their psychological well-being. To cope with the negative consequences of emerging situations and to perform their job duties efficiently, teachers of preschool educational institutions resort to

various psychological defenses and coping strategies. In modern psychology, much attention is paid to the study of psychological defenses and coping strategies of the individual in the context of psychological well-being [1; 2; 4; 7; 8; 37]. Modern studies of defense mechanisms and coping behavior are based on the model of R. Lazarus and S. Folkman, within which problem-focused and emotion-focused strategies are distinguished [21].

In the work of teachers of preschool educational institutions, their emotional intelligence and positive thinking style play an important role [41; 43]. Emotional intelligence is considered as a predictor of psychological well-being in various fields of activity, among representatives of various professions, and in stressful situations allows one to choose more effective coping strategies [9; 19; 39]. Emotional balance, along with other personal qualities such as empathy and emotional intelligence, on the one hand, can be developed, on the other hand, associated with genetic characteristics [38]. The emotional balance of preschool teachers is of great importance for the psychological well-being of children and the development of their thinking [11; 16].

In our work, the psychological well-being of teachers of preschool educational institutions is the subject of research and is understood as the actual experience of the degree of satisfaction with oneself and one's own life. We consider coping strategies as behavior that is aimed at adapting a person to the requirements of the situation; psychological defenses are a system of regulatory mechanisms aimed at eliminating or reducing negative experiences associated with states of anxiety and internal conflicts.

Purpose of the study: to establish the characteristics of psychological defenses and coping strategies among teachers of preschool educational institutions with different levels of psychological well-being.

Subject of the study: psychological defenses and coping strategies among teachers of preschool educational institutions with different levels of psychological well-being.

Research hypothesis: teachers working in preschool educational institutions and having different levels of psychological well-being may differ in psychological defenses and choice of coping strategies.

Characteristics of the sample and research methods

The study involved 62 teachers of preschool educational institutions in the city of Rostov-on-Don (kindergarten No. 215), Aksai (kindergarten No. 26 "Rosinka"), Rassvet village of the Rostov region (kindergarten No. 38 "Rainbow", kindergarten No. 12 "Cornflower"). All participants were women, the average age was 32.5 years, and the average work experience was 9.2 years.

To assess psychological well-being, we used the Ryff's Psychological Well-being Scale (adapted by T.D. Shevelenkova, P.P. Fesenko), which allows us to assess the general indicator of psychological well-being and its components such as positive relationships with others, autonomy, control of the environment, personal growth, purpose in life, self-acceptance [10; 35].

To identify types of psychological defense, the technique of E.R. Pilyugina, R.F. Suleymanov was used, the use of which makes it possible to assess the severity of psychotic (dissociation, regression, hypochondria, isolation, repression), infantile (replacement/transfer, projection, compulsive behavior, passive aggression, denial), neurotic (rationalization, avoidance, reactive formation, compensation, omnipotent control), adaptive (sublimation, altruism, suppression, anticipation, humor) defense mechanisms [34].

To assess coping strategies, the questionnaire "Types of orientations in difficult situations" by E.V. Bityutskaya, A.A. Korneev was used, aimed at identifying types of orientation in difficult situations: orientation to approaching difficulties (striving for difficulties (drive), orientation to high labor intensity (thorough-

ness), orientation to threat signals, orientation to opportunities, orientation to obstacles) and orientation to care and removal from difficulty (avoiding difficulties, conserving resources and inaction, ignoring difficulties (carelessness)) [1].

To process the results obtained, methods of mathematical statistics were used: descriptive statistics, Mann-Whitney U test.

Results

The average values of indicators of psychological well-being of teachers of preschool educational institutions, assessed using the Ryff's Psychological Well-being Scale, correspond to the average level: positive relationships with others (58.2±9.7), autonomy (56.8±9.4), environment management (55.8±10.8), personal growth (60.9±9.8), purpose in life (60.2±11.4), self-acceptance (57.2±10.7), general indicator of psychological well-being (359.4±50.8) [10].

The entire sample of teachers of preschool educational institutions was divided into three subgroups: with a high (group 1, 50%), with an average (group 2, 33%) and with a low (group 3, 17%) level of psychological well-being.

To identify differences in the psychological defenses of teachers of preschool educational institutions with different levels of psychological well-being, we will consider assessing the reliability of statistical differences using the Mann-Whitney U test between teachers with high, average, and low levels of psychological well-being (Table 1).

Table 1 shows that an assessment of the reliability of differences in the severity of types of psychological defenses between subgroups of teachers with a high (group 1)

Table 1

Results of assessing statistical differences using the Mann-Whitney U test in protective mechanisms among teachers of preschool educational institutions with different levels of psychological well-being

Protective mechanisms	Subgroups of teachers who were compared					
	Groups 1—2		Groups 1—3		Groups 2—3	
	U	p	U	p	U	p
Dissociation			58,0**	0,002	58,0*	0,048
Regression			58,5**	0,002	53,0*	0,028
Isolation			44,0***	0,000	41,0**	0,006
Repression			49,5**	0,001	49,5*	0,017
Psychotic defense mechanisms			35,0***	0,000	42,0**	0,007
Replacement/transfer					48,5*	0,015
Projection					58,0*	0,048
Passive aggression			85,0*	0,03	52,0*	0,025
Infantile defense mechanisms					37,0*	0,003
Avoidance	210,5*	0,03	36,0***	0,000	41,0**	0,006
Compensation					59,5*	0,05
Neurotic defense mechanisms			85,5*	0,03	40,5**	0,005
Sublimation	174,0*	0,005	86,0*	0,04		
Altruism	167,5**	0,005				
Suppression	215,5*	0,04				
Adaptive defense mechanisms	173,0**	0,004				

Note: * — p<0,05, ** — p<0,01, *** — p<0,001.

and average (group 2) level of psychological well-being showed the presence of significant differences in the severity of infantile psychological defenses (avoidance (U=210.5, p=0.03)) and adaptive (sublimation (U=174.0, p=0.005), altruism (U=167.5, p=0.005), suppression (U=215.5, p=0.04)) types. Teachers with an average level of psychological well-being, compared to teachers with a high level of psychological well-being, are prone to refusal and avoidance of situations and sources of unpleasant influence (protective mechanism of avoidance). Teachers with a high level of psychological well-being in difficult situations more often use adaptive psychological defense.

An assessment of the reliability of differences in the severity of types of psychological defenses between subgroups of teachers with a high (group 1) and low (group 3) level of psychological well-being showed the presence of significant differences in the severity of psychotic psychological defenses (dissociation (U = 58.0, p = 0.002), regression (U=58.5, p=0.002), isolation (U=44.0, p=0.000), repression (U=49.5, p=0.001)), infantile (passive aggression (U=85.0, p=0.03)), neurotic (avoidance (U =36.0, p=0.00)), adaptive (sublimation (U=86.0, p=0.04)) types. Teachers with a low level of psychological well-being, compared to teachers with a high level of psychological well-being, in difficult situations more often use psychological defense of predominantly psychotic, as well as infantile and neurotic types. Teachers with a high level of psychological well-being — psychological defense of the adaptive type.

An assessment of the reliability of differences in the severity of types of psychological defenses between subgroups of teachers with an average (group 2) and low (group 3) level of psychological well-being showed the presence of significant differences in the severity of psychotic psychological defenses (dissociation (U = 58.0, p = 0.048), regression (U=53.0, p=0.028), isolation (U=41.0, p=0.006), repression (U=49.5, p=0.002)), infantile (replacement-transfer (U=48.5, p=0.15), projection (U=58.0, p=0.048), passive aggression (U=52.0, p=0.25)), neurotic (avoidance (U=41.0, p= 0.006), compensation (U=59.5, p=0.005)) types. Teachers with a low level of psychological well-being compared to teachers with an average level of psychological well-being in difficult situations more often use psychological defense of psychotic, infantile and neurotic types.

The results of assessing the coping strategies of teachers of preschool educational institutions with different levels of psychological well-being are presented in the figure.

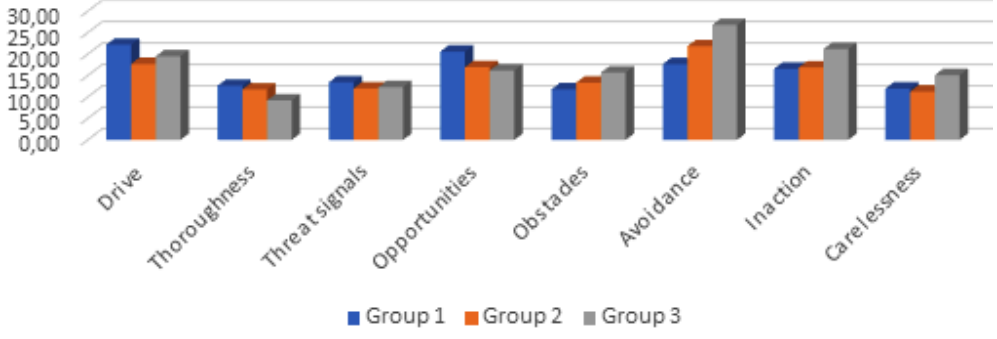

Fig. Results of a study of coping strategies of teachers of preschool educational institutions with different levels of psychological well-being (Group 1 — high level of psychological well-being, Group 2 — average level of psychological well-being, Group 3 — low level of psychological well-being)

To identify differences in the coping strategies of teachers of preschool educational institutions with different levels of psychological well-being, let us consider the results of assessing the reliability of statistical differences using the Mann-Whitney U test between subgroups of teachers with high, average, and low levels of psychological well-being (the table shows only coping strategies with significant differences obtained between subgroups) (Table 2).

From the table Figure 2 shows that the subgroup of teachers with a high level of psychological well-being (group 1) differs significantly from the subgroup of teachers with an average level of psychological well-being (group 2) in the severity of coping strategies such as “Orientation towards getting closer to difficulties” (drive (U = 202.0 , p=0.02), threat signals (U=218.5, p=0.04), opportunities (U=152.0, p=0.001)) and “Orientation towards leaving and moving away from difficulty” (avoidance (U=211.5, p=0.03)). Teachers with a high level of psychological well-being have more pronounced coping strategies such as “Orientation towards getting closer to difficulties”, while teachers with an average level of psychological well-being have more pronounced coping strategies such as “Orientation towards leaving and moving away from difficulties”.

The subgroup of teachers with a high level of psychological well-being (group 1) significantly differs from the subgroup of teachers with a low level of psychological well-being (group 3) in the level of expression of coping strategies such as “Orientation towards getting closer to difficulties” (opportunities (U=70.0, p= 0.01), obstacles (U=85.5, p=0.03)) and “Orientation towards leaving and moving away from difficulties” (avoidance (U=48.0, p=0.001), carelessness (U=83, 5, p=0.03)). At the same time, teachers with a high level of psychological well-being show a greater tendency to coping strategies such as “Orientation towards getting closer to difficulties”, teachers with a low level of psychological well-being tend to use coping strategies such as “Orientation towards leaving and moving away from difficulties” in difficult situations.

Differences were identified between subgroups of teachers with an average (group 2) and low level (group 3) of psychological well-being in the coping strategy of the type “Orientation towards leaving and moving away from difficulties” (carelessness (U = 55.0, p = 0.048)). Teachers with a low level of psychological well-being, compared to teachers with an average level of psychological well-being, are more likely to ignore difficult situations and be unwilling to resolve problems.

Table 2

Results of assessing statistical differences using the Mann-Whitney U test in coping strategies among teachers of preschool educational institutions with different levels of psychological well-being

Coping strategies	Subgroups of teachers who were compared					
	Groups 1—2		Groups 1—3		Groups 2—3	
	U	p	U	p	U	p
Striving for difficulties (drive)	202,0*	0,02				
Threat signals	218,5*	0,04				
Opportunities	152,0**	0,001	70,0*	0,01		
Obstacles			85,5*	0,03		
Avoidance	211,5*	0,03	48,0**	0,001		
Carelessness			83,5*	0,03	55,0*	0,048

Note: * — p<0,05, ** — p<0,0.

The discussion of the results

Our results on the presence of differences in the manifestation of psychological defenses among teachers of preschool educational institutions with different levels of psychological well-being indicate that teachers with a high level of psychological well-being in difficult situations use psychological defenses of an adaptive type (sublimation, altruism, suppression). Teachers with average and low levels of psychological well-being in difficult situations more often use psychological defense of psychotic, infantile and neurotic types. In the work of G.E. Vaillant also obtained similar data that a higher level of psychological well-being corresponds to a higher tendency to use such psychological defense as sublimation [37].

Our work revealed differences in coping strategies among teachers of preschool educational institutions with different levels of psychological well-being. Teachers with a high level of psychological well-being are distinguished by a greater preference for coping strategies related to the type "Orientation towards rapprochement, interaction with difficulty." In difficult and stressful situations, they can assess the complexity of such a situation or anticipate possible difficulties; a difficult situation can evoke in them positive emotions and a surge of strength and help intensify the search for resources to achieve goals. Teachers with a low level of psychological well-being tend to choose coping strategies of the "Orientation towards leaving and moving away from difficulty" type; when they perceive a difficult situation, they tend to evaluate it as more difficult, requiring a lot of effort and resources to resolve it, and tend to avoid it.

Research on the psychological well-being of teachers in preschool educational institutions is being conducted in various countries, as there is a growing understanding that only a teacher who feels his own well-being will be able to have a positive impact on preschool children. These works note the presence of stressful situations in the work of teachers working with preschool children, as well as the resulting emotional burnout and exhaustion among teachers [42]. Teachers of preschool educational institutions use active coping strategies to overcome difficulties that arise in their work. Teachers of preschool educational institutions who use avoidant coping strategies evaluate stressful situations that arise at work negatively and do not consider them as conducive to personal growth [27].

The data obtained in our work is confirmed by the results of other studies, which also indicate that the psychological well-being of teachers working with preschool children depends on the extent to which they themselves perceive the stressful conditions of their work as useful for themselves and encouraging self-development [31]. Studies have found that the higher the level of psychological well-being, the more a person is focused on a strategy for resolving the situation [2; 10]. The use of adaptive coping strategies and a positive attributional style helps to increase the psychological well-being and job satisfaction of teachers [6]. Persons with a low level of psychological well-being are characterized using maladaptive coping strategies and a pessimistic attributional style [4]. Teachers with high levels of psychological well-being and a positive assessment of opportunities for self-development in the professional field show inclinations towards more productive coping behavior aimed at directly resolving emerging problem situations [5]. A meta-study of factors influencing the psychological well-being of teachers, including those working in preschool educational institutions, showed that such factors include personal abilities, social-emotional competence, reaction to working conditions and professional relationships, with a high level of self-efficacy [32].

Based on the data we obtained and on the work of other authors, it can be noted that the predominance of coping strategies aimed

at resolving a difficult situation or avoiding it can act as an important predictor of the psychological well-being of teachers of preschool educational institutions [12].

The prospects for our work include assessing the age dynamics of the characteristics of psychological well-being, defense mechanisms and coping strategies of teachers of preschool educational institutions.

Conclusion

The conducted research allowed us to conclude that teachers of preschool educational institutions with different levels of psychological well-being may differ in psychological defenses and coping strategies.

Teachers with a high level of psychological well-being more often use adaptive psychological defenses, such as sublimation, altruism, and suppression. Teachers with an average level of psychological well-being more often use infantile-type psychological defenses, such as avoidance. Teachers with a low level of psychological well-being more often use psychological defense of psychotic (dissociation, regression, isolation, repression), as well as infantile (substitution-transfer, projection, passive aggression) and neurotic (avoidance, compensation) types.

Teachers of preschool educational institutions with a high level of psychological well-being are distinguished by a greater preference for coping strategies related to the type "Orientation towards rapprochement, interaction with difficulty." Teachers of preschool educational institutions with average and especially low levels of psychological well-being are prone to greater use of coping strategies of the "Orientation towards care and removal from difficulties" type.

The scientific novelty of the study lies in expanding the understanding of the characteristics of coping strategies and psychological defenses among teachers of preschool educational institutions with different levels of psychological well-being.

The results of the study will be useful to teachers, psychologists and specialists interacting with teachers of preschool educational institutions. The results of the study can be used in psychoprophylactic and psychocorrectional working with teachers of preschool educational institutions.

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Mindfulness, Academic Competency and Academic Self-efficacy: A Cross-sectional Study

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This cross-sectional study aimed to investigate the relationship between mindfulness and academic competency among International students in China, as well as the potential mediating role of academic self-efficacy in this association. International students in China (n=476) were recruited to complete the Mindful Attention Awareness Scale (MAAS), the Academic Self-efficacy Scale (ASES), and the competence subscale of the Positive Youth Development Inventory (PYDI). The results found that mindfulness correlated positively with academic self-efficacy and academic competency. Furthermore, the results revealed that the mediation model fit the data well; academic self-efficacy partly mediated the association of mindfulness with academic competency. We concluded that this insight contributes to a better understanding of the interplay between mindfulness, academic competency, and the psychological aspects of academic self-efficacy, providing valuable implications for interventions and strategies to promote academic performance among the target population.

Keywords: academic competence; international students; self-efficacy; mindfulness.

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Внимательность, академическая компетентность и академическая самоэффективность: перекрестное исследование

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Целью данного исследования было изучение связи между осознанностью и академической компетентностью среди иностранных студентов в Китае. Помимо этого, исследование также рассматривало возможную посредническую роль академической самоэффективности в этом контексте. Иностранным студентам в Китае (n=476) предложили заполненить шкалу осознанного внимания (MAAS), шкалу академической самоэффективности (ASES) и подшкалу компетентности «Инвентарь позитивного развития молодежи» (PYDI). Результаты показали, что осознанность положительно коррелирует с академической самоэффективностью и академической компетентностью. В дополнение к этому результаты показали, что модель хорошо отражает данные — академическая самоэффективность играет частичную посредническую роль в связи между осознанностью и академической компетентностью. Результаты исследования способствуют лучшему пониманию взаимосвязи между осознанностью, академической компетентностью и психологическими аспектами академической самоэффективности. В дополнении даны ценные рекомендации для разработки стратегических мероприятий, направленных на продвижение академической успеваемости среди целевой аудитории.

***Ключевые слова*:** академическая компетентность; иностранные студенты; самоэффективность; осознанность.

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Introduction

Students' academic success is one of educational institutions' primary goals. Therefore, educational and psychological studies on the subject of students' academic performance have become the focus of scientific research for a long time. With the emergence of psychological variables and new techniques, the research

in this area has continued in pursuit of achieving high performance for students in schools and universities. Among these essential topics in psychology, mindfulness arose as one of the most critical applications of positive psychology [4; 23]. It significantly improves students' efficiency and alleviates their academic and psychological problems during learning [3]. Mindfulness is the practice of paying attention to where you are and where your thoughts are flowing on a minute-by-minute [35; 65]; it contributes directly to non-judgment, self-criticism, and increased self-understanding and thus helps the individual to move away from irrational thinking [64]. Mindfulness is based on increasing awareness, moment by moment, which may facilitate openness to experiences and experiences. Mindfulness enhances a sense of life and exploration of meaning [76].

Several studies have emphasized that mindfulness positively correlates to academic performance [43; 45; 47; 74]. Mindfulness techniques have been shown to improve academic performance, including success in school [15; 8], test performance [30; 62], recall of learning information [22; 40; 53], student ability [29], grade point average [54], and classroom climate [61].

Self-efficacy is another crucial variable that helps to improve students' academic performance, where self-efficacy plays a role in academic performance [20]. Therefore, this study investigates the mediating role of self-efficacy in the association of mindfulness and academic competence among International students in China.

Mindfulness and academic competence

Mindfulness has been defined as the ability to intentionally bring awareness to experience in the present moment with a tendency to openness and curiosity. Mindfulness is a flexible mental activity open to new ideas to create new and practical needs [41]. According to Brown and Ryan [14], mindfulness refers to attention and acceptance of reality, awareness of everything related to the events of the current experience, and not making judgments about them. Mindfulness meditation entails concentrating on a single procedure, such as breathing, acknowledging distracting thoughts or emotions, and then letting them go [33]. Furthermore, mindfulness Develops Meta-Cognitive Awareness, which is learned to notice thoughts or feelings, with which we need to act to counteract negative feelings and encourage the individual to develop a perspective [36]. Mindfulness is affected by the individual's abilities, personal expectations, motivation, and ability to plan and achieve later. Students who practice mindfulness have been shown to achieve higher test scores than students who do not [5; 29; 57]. Mindfulness helps outstanding students reconcile with themselves, especially those who suffer from stress, reflected in the soundness of their thinking by following specific patterns of thinking, such as reflective or analytical thinking [34].

Academic performance can be defined as an individual's demonstrated level of knowledge in a specific subject or area or the degree to which they achieve specific goals established by their educational context [68; 69]. Academic performance is doing something to achieve the desired result, such as success in a skill or set of information. Academic performance refers to the amount of individual school learning that is measured using a variety of tests such as math and dictation. Academic performance refers to a student's success in academic subjects [45]. According to Bennett, Egan [10], mindfulness techniques could be used in academic settings (Miller, Fletcher, and Kabat-Zinn, 1995). Studies linked mindfulness to improvements in various desirable academic outcomes, such as understanding reading [51], increasing working memory capacity [21; 27; 52], enhancing students' knowledge [17], self-regulation of attention [49], quickly recalling [5; 12; 21], and improving attentional functions and flexibility [39; 50; 72].

Dispositional mindfulness positively predicts academic performance[1; 2], whereas self-destruction and self-criticism are negative predictors [37]. Classroom climate mediated the relationship between mindfulness and predicted academic performance [44]. Empirical studies such as [5; 62; 71; 79] found that mindfulness interventions improve students' academic performance. A study by Ramsburg and Youmans [57] examined the impact of meditation on

knowledge retention among university students. The results showed that the brief mindfulness meditation improved students' retention of the information presented during the lecture. Another study by [9] examined the impact of a 5-week mindfulness meditation intervention in academic outcomes among 34 students with learning disabilities and found that social skills and academic performance improved. In contrast, the state and trait of anxiety decreased. Accordingly, this study proposes the following hypothesis:

H1: Mindfulness is positively associated with academic competence in International students.

Academic self-efficacy as a mediator

According to Bandura [6], self-efficacy is the belief in one's ability to perform at a certain level and change events in one's life. Self-efficacy is the capacity to carry out the planned behaviour and then modify the course of events to effect change and advancement.

As a particular subset of self-assessment of problem-solving abilities on educational training, academic self-efficacy is a subset of general self-efficacy that includes beliefs and personal achievement judgments about academic goals [31], such as learning objectives, assignments, or exceeding academic levels [7]. Accordingly, self-efficacy is the growth of activities, content, knowledge, interest in learning, or educational competencies like research [58].

The educational psychology and education section is interested in and analyses academic self-efficacy [60]. Present research indicates that there is a relationship between academic performance and self-efficacy [20] or between learning self-regulation and academic performance [75], school performance [59], attitudes toward research, academic resilience, academic well-being, and psychological changes in the school context [19], among other relationships.

Research revealed that academic self-efficacy may play a role in the association of mindfulness with various variables such as depression, anxiety and stress [58], competitive state anxiety [63] and subjective well-being [56]. At the same time, no study has been conducted to investigate the potential mediating role of self-efficacy in the association between mindfulness and academic competence. As a result, research on academic competency provides a means of understanding educational dynamics and facilitating their intervention, especially in light of the challenges that educators, students, and the educational system can encounter. The findings indicated that self-efficacy, academic achievement, and mindfulness correlate positively [11; 32; 77].

Therefore, our study tries to investigate the potential mediating role of academic self-efficacy in the association between mindfulness and academic competence, and the supposes the following hypothesis:

H2: Academic self-efficacy mediates the association of mindfulness with academic competence in International students.

Method

Participants.

A total of 476 international students (Males 67%, and Females 33%) who study in China voluntarily participated in this study. They received informed consent, assuring the privacy of their responses. The age of the research sample ranged from 18 to 36 years (M_{age} 28.85±2.42). All of them were international students and had not had any mindfulness training before.

Measurements.

— **Mindfulness**. This study used the 15-item Mindful Attention Awareness Scale (MAAS) [13]. Every item was rated on a 6-point Likert scale, where one meant "*rarely*" and six meant "*almost always*." Items with negative wording were switched around so that high scores correspond to increased mindfulness levels. Cronbach's alpha for this investigation was 0.90.

— Academic self-efficacy. This study has made use of the Academic Self-efficacy Scale (ASES), which consists of ten questions (García, Inglés, Torregrosa, Ruiz, Díaz, Pérez & Martínez, 2016). A 5-point Likert scale, with one denoting "strongly disagree" and five denoting "strongly agree," was used to score each item. Cronbach's alpha for this study was 0.72.

— **Academic Competence.** The participants' academic competency was evaluated using the competence subscale of the Positive Youth

Development Inventory (PYDI) (Arnold, Nott, & Meinhold, 2012). Fourteen items on this scale had a 5-point Likert scale, with one denoting "*strongly disagree*" and five denoting "*strongly agree*." The current study's alpha reliability was 87.

Data Analysis.

The study variables were correlated using the Pearson correlation coefficient. The mediation analyses used the PROCESS macro (version 3.5) on SPSS [70]. Five thousand bootstrap re-samples were used in the models of this study to investigate the mediated effects and generate 95% confidence intervals.

Results

Correlations among the study variables.

The results (Table 1) revealed that mindfulness correlated positively with academic self-efficacy and competency.

Table 1

Correlation among study variables

Variables	1	2	3
1. Mindfulness	1		
2. Academic self-efficacy	.573**	1	
3. Academic Competence	.880**	.902**	1
Mean	32.01	22.33	56.69
Standard Deviation	7.571	5.827	13.495

Note. $p<0.01$.

Direct and indirect effects of mindfulness on academic competence

To investigate mindfulness's influence on academic competence we adopt the bias-corrected percentile bootstrap method (Macro PROCESS in SPSS, sample=5000, 95% CI) to test the mediating effect results. When mindfulness was used as the independent variable, academic competence as the dependent variable, and academic self-efficacy as the mediating variable, the results were as follows: The total effect of mindfulness on academic competence is significant ($\beta=0.18$, $p<0.05$), the direct effect of mindfulness on academic competence is significant ($\beta=0.10$, $p<0.05$). Mindfulness positively predicted academic self-efficacy. Academic self-efficacy positively predicted academic competence. Finally, the bias-corrected percentile bootstrap method indicated that the indirect effect of mindfulness on academic competence through academic self-efficacy was significant, ab=0.08, SE=0.02, 95% CI=[0.07, 0.20]. This indicates that self-efficacy partly mediated the effect of mindfulness on academic competence. See table 2 for more details.

Discussion

The first aim of our study is to investigate the relationship between mindfulness and academic competency. The results revealed that mindfulness correlated positively with academic self-ef-

Table 2

Testing the mediation effect of mindfulness on academic competence

Model	b	SE	t	95% CI	p
Mindfulness→Academic self-efficacy (a)	**.10**	.02	4.26	[.06, .13]	0.00
Academic self-efficacy→Academic competence (b)	**.85**	.04	40.12	[.77, .92]	0.00
Mindfulness→Academic competence (c')	**.10**	.02	4.73	[.06, .13]	0.00
Mindfulness→Academic self-efficacy→Academic competence	**.08**	.02	5.34	[.04, .11]	0.00
Total effect (Mindfulness→Academic competence (c')	**.18**	.03	8.60	[.12, .23]	0.00

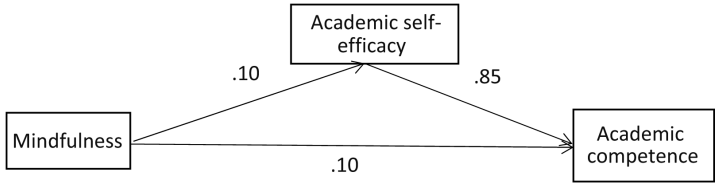

Fig. 1. The Mediation Effect of Mindfulness on Academic Competence

ficacy and academic competency. This result is partially consistent with previous studies such as [38; 42; 63]. The positive relationship between mindfulness and academic self-efficacy and academic competency among international students studying in China may be because mindfulness practices, such as meditation and deep breathing, reduce stress and promote a sense of calm. For international students facing the challenges of adapting to a new culture, language, and educational system, practising mindfulness could help alleviate stress and contribute to a more positive mindset, enhancing academic self-efficacy and competency. Mindfulness involves being fully present and attentive to the current moment. Mindfulness practices may improve concentration and focus, leading to better academic performance [28; 43; 46; 48; 78]. This heightened attention to tasks could increase academic self-efficacy, as individuals feel more capable of managing their academic responsibilities. Mindfulness practices often involve cultivating awareness of emotions without judgment. International students may face various emotions, including homesickness, cultural adjustment, and academic pressure. Mindfulness can help individuals regulate their emotions, fostering emotional well-being. This emotional regulation may positively impact perceptions of self-efficacy and overall academic competency.

The second aim of this study was to investigate the potential mediating role of academic self-efficacy in the association of mindfulness with academic competency. Our results revealed that academic self-efficacy partly mediated the association of mindfulness with academic competency. That's because academic self-efficacy refers to an individual's belief in their ability to succeed academically. Mindfulness practices enhance individuals' awareness and acceptance of their capabilities, increasing self-efficacy [24; 25; 55]. This boost in self-efficacy can positively influence academic competency by fostering a more confident and proactive approach to learning and problem-solving [73]. Mindfulness practices often reduce stress and improve emotional well-being [16; 18]. Reduced stress levels can contribute to a more positive mindset and increased belief in one's ability to handle academic challenges. Individuals may approach tasks more confidently as academic self-efficacy grows, leading to improved academic competency. Mindfulness practices, which involve being fully present in the moment, can enhance concentration and focus [26; 67]. Individuals who engage in mindfulness may experience improved attention during academic tasks [53]. This increased focus can contribute to a sense of mastery over academic activities, influencing academic self-efficacy and, consequently, academic competency.

Mindfulness practices often encourage individuals to accept and cope with challenges rather than avoid or resist them [66]. By developing adaptive coping strategies, individuals may feel more capable of addressing academic difficulties, leading to higher academic self-efficacy. This increased self-efficacy can positively impact academic competency. Mindfulness practices have been associated with cognitive benefits, including improved problem-solving skills and memory [4]. These cognitive enhancements may contribute to individuals feeling more capable in their academic pursuits, influencing academic self-efficacy and, subsequently, academic competency. It's important to note that the term "partly mediated" indicates that while academic self-efficacy plays a significant role in explaining the relationship between mindfulness and academic competency, other factors may also be at play. The specific mechanisms of this mediation should be further explored through research, considering contextual factors and individual differences to gain a more comprehensive understanding of the relationship between mindfulness, academic self-efficacy, and academic competency.

Limitations and future directions

While the study provides valuable insights into the relationship between mindfulness, academic self-efficacy, and academic competency among international students in China, it's essential to acknowledge its limitations and suggest potential directions for future research. The first limitation is that the study was designed as a cross-sectional study, which limits the ability to establish causation. Longitudinal or experimental designs would provide a more robust

understanding of the temporal relationships between mindfulness, academic self-efficacy, and academic competency. Second, this study relies on self-report measures, which may be subject to biases such as social desirability or response tendencies. Future research could benefit from incorporating objective measures or multiple sources of data to enhance the reliability and validity of the findings data sources to enhance findings reliability and validity in China, and the findings may need to be more generalisable to other cultural contexts or student populations. Future research should consider diverse samples to explore the generalizability of the observed relationships.

Future research should conduct longitudinal studies to examine the dynamic nature of the relationships over time. This would help establish temporal precedence and clarify the directionality of the associations. In addition, future research should explore cultural variations in the relationship between mindfulness, academic self-efficacy, and competency. Comparing findings across different cultural contexts can enhance the study's external validity. Incorporate objective measures of academic performance to complement self-reported competency assessments. This would strengthen the validity of the findings by providing a more objective indicator of academic success.

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