

UDK 376.37:373.31  
BBK 4457.024.3  
GSNTI 14.29.01  
Code VAK 13.00.03

**O. B. Inshakova**  
Moscow, Russia

## VARIABILITY OF DYSGRAPHIA IN PRIMARY SCHOOL PUPILS

**Abstract.** The article presents the results of a longitudinal study of all types of errors characterizing the eponymous forms of dysgraphia (acoustic-articulatory, motor, visual-motor, visual-spatial, sound analysis and synthesis) in primary school pupils of a general education school. The question whether the dominant form of dysgraphia revealed in a first-grade pupil is permanent, or whether it is replaced by some other form by the end of primary school remains unsettled until now. Its solution appears to be critical in determining the rehabilitation strategy for pupils with stable dysgraphia. Therefore, the experimental study is aimed at dynamic analysis of dysgraphia forms in the process of a longitudinal experiment. The monitoring of phonemic writing skill formation combined with retrospective analysis of its results in pupils with dysgraphia shows the presence of several forms of dysgraphia in every year of learning (from the first to the fourth grade), where one such form is dominant. The monitoring results have revealed a change of the dominant form of dysgraphia: from dysgraphia of sound analysis and synthesis in the first grade to motor dysgraphia by the fourth year of learning. Variability of dysgraphia forms, corroborated by the experimental data obtained should be taken into account in rehabilitation work with the children of the given category.

**Keywords:** dysgraphia; logopedics; primary school pupils; primary school; forms of dysgraphia; writing disorders.

**About the author:** Inshakova Ol'ga Borisovna, Candidate of Pedagogy, Professor.

*Place of employment:* Department of Logopedics, Faculty of Defectology, Institute of Childhood, Moscow State Pedagogical University, Moscow, Russia.

*E-mail:* olgainsh@mail.ru.

Interest in the problems of teaching writing and the difficulties of the phonemic writing skills formation have been stable over the past 50 years. This is associated, first of all, with the low efficiency

of the existing learning rehabilitation programs and the inadequate study of the phenomenon of dysgraphia with its complex nature, which prevents primary school pupils from mastering the communicative competence lying at the basis of acquisition of academic knowledge designated by the general education program.

Theoretical analysis of the literature and the practical work experience in the field of logopedics show that formation of writing skills in children during the first years of learning is often complicated by dysgraphia. At the present stage of empirical research, dysgraphia is studied separately from another writing disorder – dysorthography (O. I. Azova [1], O. V. Eletskaia [4], R. I. Lalaeva [8], E. A. Loginova [11], L. G. Paramonova [12], E. V. Prishchepova [13], etc.). Dysgraphia is looked upon as a specific disorder characterized by a complex of symptoms (A. N. Kornev [7]). The presence of stable writing errors of a special kind made by children in various written works is the most important symptom in this complex (O. B. Inshakova [6]). Other, in no way less important symptoms of dysgraphia include speech disorders, varying in their nature, which are usually less vividly expressed than writing disorder: dissociation between the typical level of development of the general intellect indica-

tor (IQ) and the low level of acquisition of writing, unnatural for typical children predominance of the non-verbal intellect indicator over the verbal one keeping their specific structure, poor formation of a number of indicators of development of the higher psychological functions (programming, regulation, control, procession of auditory and visual information, etc.); impairment of automation of the acquired writing skill; impossibility of spontaneous treatment of disorder without specially organized logopedic work; and reduced working capacity. In diagnostic observation, the above-mentioned symptoms of dysgraphia may be used as criteria for its diagnostics.

The experience of rehabilitation support convincingly shows that dysgraphia is rather often caused not only by speech disorders but also by poor formation of non-speech components of the functional system of writing (R. E. Levina [9; 10], T. V. Akhutina [2; 3], R. I. Lalaeva [8], A. N. Kornev [7], I. N. Sadovnikova [14], G. V. Chirkina [16], etc.).

However, the specificity of the impairment of the writing skill acquisition in cases of dysgraphia has not been properly studied yet. The question whether the dominant form of dysgraphia revealed in a first-grade pupil is permanent, or whether it will be replaced by some other form by the end of primary school

remains unsettled until now. It is also worthy of note that there is no uniform approach to detection of the forms of dysgraphia and no theoretical foundation of distinction between dysgraphia and dysorthographia. It should be noted that the presented research defines the forms of dysgraphia on the basis of the typology of errors with a uniform mechanism of development and impairing the acquisition of the phonemic principle of writing, taking into account the new tendencies in the diagnostics of dysgraphia.

The absence of works targeted at the study of variability of the forms of dysgraphia and the need to get this information for better understanding of the mechanisms and the ways of rehabilitation of this disorder determine the urgency of the given research.

This comprehensive problem can be solved only via monitoring the process of acquisition of writing by primary school pupils with dysgraphia.

The experimental study is aimed at dynamic analysis of dysgraphia forms in the process of a longitudinal experiment in the course of 4 years of primary education.

206 pupils of general education schools make up the sample taking part in the longitudinal experiment. All the participants completed such tasks as dictation and copying printed and hand-written texts.

Specially designed and validated methods have been used to detect dysgraphia in the primary school pupils. The results obtained have been processed and analyzed with the help of mathematical statistics methods (O. B. Inshakova [5; 6]).

More than 5,000 written works (dictations and copying printed and hand-written texts) have been collected and analyzed in the process of empirical study of the general sample of the primary school children of the general education school. The results of their analysis allow us to single out all errors violating the phonemic principle of writing: acoustic-articulatory, sound analysis and synthesis, motor, visual-motor and visual-spatial ones, which are referred by us to dysgraphic errors. It should be noted that the group of dysgraphic errors does not include errors of agrammatical nature reflecting poor acquisition of orthographic rules regulated by morphological, traditional and other principles of writing which are referred by us to the sphere of dysorthography, as well as optical errors which have not been registered in the process of observation of the general sample of the pupils of the general education primary school (replacement and mixing up the letters  $з — \partial$ ,  $e — c$ ,  $y — \partial$ ). The absence of such errors in the works of the general education school pupils was reported by I. N. Sadovnikova [14] in her earlier

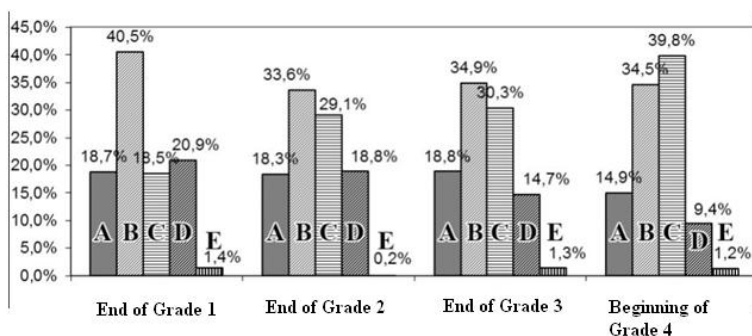
writings, commenting that they were only typical of children with visual impairment.

Two groups of children were formed on the results of the longitudinal study of the children of the general sample: the control group (CG) including 66 pupils successfully mastering phonemic writing, and the experimental group (EG) of 56 pupils with dysgraphia. All pupils of the EG with disorders of oral speech and writing have been provided logopedic assistance at the logopedic facility of the general education institution.

The comparative analysis of the results of the longitudinal observation of acquisition of the phonemic writing skill shows that all EG children (in comparison to CG children) make significantly more dysgraphic errors in written works: errors of

sound analysis, motor, acoustic-articulatory (or phonemic), visual-motor (graphical search, inadequate letter shaping and visual-gnostic errors, for example  $v - u, u - v$ , etc.) and visual-spatial errors (mirror errors), the number of which reflects the degree of manifestation of the namesake forms of dysgraphia.

The monitoring of phonemic writing skill formation combined with retrospective analysis of its results in EG pupils shows the presence of several forms of dysgraphia in every year of learning (from the first to the fourth grade), where one such form is dominant. The dominating form of dysgraphia in each grade is singled out on the basis of percentage of the predominant kind of errors. The results are given in the diagram below.



**Figure.** Dysgraphia forms in EG pupils.

*Note:* A — errors of phonemic perception; B — errors of sound analysis and synthesis; C — motor errors; D — visual-motor errors; E — visual-spatial errors.

It follows from the diagram that the form of dysgraphia caused by sound analysis and synthesis of speech units (40.5 %) predominates poor formation of the operations of

in the EG pupils **at the end of Grade 1.**

Omissions of vowel letters are more frequent errors referring to this form of dysgraphia. It is well known that this is associated with the fact that at the initial stage of learning, recognition of the vowel in the syllable is more difficult in comparison to the recognition of the consonant sound, as the kinesthetic signal in the vowel pronunciation is weaker than in that of the consonant, and, as a result, is more difficult to recognize. This fact may predict that coding information during writing will be done with mistakes.

Visual-motor (20.9 %), acoustic-articulatory (18.7 %) and motor (18.5 %) forms of dysgraphia are recorded significantly more seldom in Grade 1. Visual-spatial form of dysgraphia characterized by mirror writing of letters, syllables and short words is found very rarely.

Predominance of dysgraphia associated with impairment of the operations of phonemic analysis and synthesis in first graders is caused by inadequate phonemic awareness and poor formation of successive operations ensuring planning and performance of smooth graphomotor movements following one another in time and space. For school children, these operations present complex mental activities equally important not only for perception of speech infor-

mation but also for its precise reproduction, which is especially significant for writing.

**In Grade 2,** the domineering position of the form of dysgraphia caused by impairment of the operations of sound analysis and synthesis persists. However, its quantitative manifestation decreases in comparison to Grade 1. The number of errors demonstrating the manifestation of the motor form of dysgraphia grows markedly on this background.

At this time, acoustic-articulatory and visual-motor forms of dysgraphia continue to be found with equal frequency (18.3 : 18.8 %), remaining practically the same as in Grade 1. Visual-spatial dysgraphia is expressed minimally.

**In Grade 3,** insignificant changes emerge with the dominance of the form of dysgraphia caused by impairment of the operations of sound analysis and synthesis still remaining. Beginning with Grade 3, the number of vowel letter omissions in written works begins to match the number of consonant letter omissions, which testifies to a change in the quality of errors.

The motor form of dysgraphia is manifested even more vividly than in Grade 2; the manifestations of visual-motor dysgraphia start to decrease. The visual-spatial form of dysgraphia is expressed minimally as before.

**In Grade 4**, the number of errors characterizing the acoustic-articulatory and visual-motor forms of dysgraphia slightly decreases, which is due to the traditional logopedic work carried out during the first years of learning. Only one form of dysgraphia remains to be stable – dysgraphia caused by impairment of the operations of sound analysis and synthesis of speech units.

The increase of motor errors and the domineering of the motor form of dysgraphia in Grade 4 of the EG may be considered paradoxical. This fact shows that the motor graphic skills do not develop in children with dysgraphia at this age. Motor errors at this period of learning usually include writing extra elements of letters (40% of the total of motor errors), and, more rarely, errors of kenesthetis start (33 %), omission of elements of letters (16 %) and perseveration of letters and syllables (11 %).

Motor errors begin to be manifested more vividly as a result of growing general academic load and requirements to such aspects of writing as speed, connectedness and smoothness. Alongside errors, the pupils demonstrate unstable handwriting, its degradation, which can be observed even in the course of one learning day.

Problems with the formation of the motor component of writing indicate the presence of dyspraxia

manifestations in the EG children which are characterized by disorders of movement coordination in the performance of complex motor actions.

Dyspraxia manifestations can hardly be noted in Grade 1, when the number of written tasks is small. The growing learning load, significantly increased requirements to writing speed, as well as to the need to distribute attention between the underdeveloped technical aspect of writing and use of orthographic rules lead to the situation, when these dyspraxia manifestations begin to aggravate. All this is reflected in the increase of the number of motor errors in writing.

We may assume that dyspraxia manifestations and writing problems associated with them dictate the necessity to use the sufficient amount of exercises at logopedic lessons aimed at the formation of serial organization of the rhythmic structure of writing, and the preservation of the corresponding sections of the program, especially at the initial stage of learning, which are overlooked or disregarded in the modern educational programs.

The results of our research saliently illustrate a number of important conclusions.

**First**, not a single form of dysgraphia exists in isolation. The dominant form of dysgraphia in each year of learning is accom-

panied by errors typical of other forms of dysgraphia.

**Second**, there is no one fixed form of dysgraphia in primary school children. The dominant forms of dysgraphia alternate in the process of primary education, the same as their degree of manifestation does, which either increases or decreases.

**Third**, the predominance of the motor form of dysgraphia in EG children by the time of finishing primary schooling indicates the necessity of inclusion of the formation of graphomotor functions in the process of logopedic classes held from Grade 1 through Grade 4.

**Fourth**, complete rehabilitation of dysgraphia in children by the end of primary education does not take place without special work on the motor components of writing, irrespective of traditional logopedic work aimed at overcoming speech disorders, development of phonemic awareness and the skills of sound and sound-letter analysis and synthesis participating in the production of writing.

**Fifth**, the data obtained convincingly testify to the need to introduce corrections in the general educational program of teaching writing to primary school pupils by way of increasing academic time allocated for the acquisition of the graphical skills of writing, and training pupils to write elements of letters, whole letters and their clus-

ters accompanied by rhythmic movements of the hand.

#### References

1. Azova, O. I. Dizorografiya : monogr. / O. I. Azova. — M.: TTs «Sfera», 2015. — 368 s.
2. Akhutina, T. V. Neyropsikhologicheskii podkhod k izucheniyu trudnostey pis'ma i chteniya / T. V. Akhutina // Rannaya diagnostika, profilaktika i korrektsiya narusheniy pis'ma i chteniya : materialy II Mezhdunar. konf. Ros. assotsiatsii disleksii. — M.: Izd-vo Mosk. sots.-gumanit. in-ta, 2006. — S. 14—23.
3. Akhutina, T. V. Trudnosti pis'ma i ikh neyropsikhologicheskaya diagnostika / T. V. Akhutina // Pis'mo i chtenie: trudnosti obucheniya i korrektsii : ucheb. posobie / pod obshch. red. O. B. Inshakovoy. — M.: Izd-vo MPSI; Voronezh : Izd-vo NPO «Modek», 2001. — S. 7—20.
4. Eletskaia, O. V. Logopedicheskaya rabota po korrektsii dizorografii u uchashchikhsya pyatykh klassov obshcheobrazovatel'noy shkoly : dis. ... kand. ped. nauk / Eletskaia O. V. — SPb., 2008. — 221 s.
5. Inshakova, O. B. Longityudnyy analiz proyavleniy disgrafii u uchashchikhsya nachal'noy shkoly / O. B. Inshakova // Spetsial'noe obrazovanie. — 2017. — № 3 (47).
6. Inshakova, O. B. Problemnye voprosy izucheniya narusheniy pis'ma u mladshikh shkol'nikov obshcheobrazovatel'nykh shkol / O. B. Inshakova, A. G. Inshakova // Prakticheskaya psikhologiya i logopediya. — 2003. — № 1—2. — S. 37—41.
7. Kornev, A. N. Narusheniya chteniya i pis'ma u detey / A. N. Kornev. — SPb.: Rech', 2003. — 330 s.
8. Lalaeva, R. I. Disgrafiya i dizorografiya kak rastroystvo formirovaniya yazykovoy sposobnosti u detey / R. I. Lalaeva // Izuchenie narusheniy pis'ma i chteniya. Itogi i perspektivy : materialy 1 Mezhdunar. konf. Ros. assotsiatsii disleksii. — M.: Izd-vo MSGI, 2004. — 296 s.
9. Levina, R. E. Narusheniya pis'ma u detey s nedorazvitiem rechi / R. E. Levina. — M.: Izd-vo APN RSFSR, 1961. — 311 s.
10. Levina, R. E. Svyaz' orfograficheskikh zatrudneniy u mladshikh shkol'nikov s

osobnostyami ikh rechevogo razvitiya / R. E. Levina // Tezisy dokl. 3-y nauch. sessii po defektologii. — M., 1960. — S. 139—142.

11. Loginova, E. A. Dizorfografiya i ee proyavleniya v pis'me uchaschchikhsya / E. A. Loginova, O. V. Eletskaia // Shkol'nyy logoped. — 2005. — № 4 (7). — S. 5—8.

12. Pamonova, L. G. Preduprezhdenie i preodolenie dizorfografii u detey s obshchim nedorazvitiem rechi : ucheb. posobie / L. G. Pamonova. — SPb. : LGU im. A. S. Pushkina, 2012. — 140 s.

13. Prishchepova, I. V. Dizorfografiya mladshikh shkol'nikov : ucheb. posobie / I. V. Prishchepova. — SPb. : KARO, 2006. — 240 s.

14. Sadovnikova, I. N. Narushenie pis'mennoy rechi u mladshikh shkol'nikov / I. N. Sadovnikova. — M. : Prosveshchenie, 1983. — 111 s.

15. Tsvetkova, L. S. Neyropsikhologiya scheta, pis'ma i chteniya: narushenie i vosstanovlenie / L. S. Tsvetkova. — M. : MPSI ; Voronezh: Izd-vo NPO «Modek», 2000. — 304 s.

16. Chirkina, G. V. Nedostatki pis'ma u detey s defektami artikulyatsionnogo apparata, puti ikh preodoleniya i preduprezhdeniya : avtoref. dis. ... kand. ped. nauk / Chirkina G. V. — M., 1967. — 18 s.