

ANETA DOMAGAŁA, URSZULA MIRECKA

Maria Curie-Skłodowska University in Lublin
Department of Logopedics and Applied Linguistics

Handwriting and Letter-Like Designs in the Clinical Assessment of Children with Multiple Disabilities

SUMMARY

The present article, using the example of children with multiple disabilities, determines diagnostic procedures regarding graphomotor skills in the cases of spoken and written language disorders. The logopedic assessment is carried out using the *Profile of Graphomotor Skills* – the authorial diagnostic tool that enables diagnosis of developmental dysfunctions based on the course of graphomotor activities (such as writing/here: copying a text/ and drawing letter-like designs /here: reproducing designs/) and on the analysis of products (handwriting and letter-like designs). The graphic level of letter-like designs and the graphic level of handwriting can vary because in particular cases different phenomena may manifest determined by the specificity of verbal and written communication.

Key words: graphomotor skills, multiple disabilities, verbal and written communication, logopedic diagnosis

INTRODUCTION

The *Profile of Graphomotor Skills* consists of the *Observation Protocol* and the *Chart of Assessment of Handwriting and Letter-like Designs* (we have already presented selected detailed problems concerning the use of this instrument in logopedic diagnosis in separate articles: Domagała, Mirecka 2009a, 2009b, 2009c, 2010a, 2010/11, 2012a). The *Observation Protocol* was developed using publications on the writing activity and disorders in its course – Spionek (1965, 1980), Wróbel (1963, 1980, 1985), Kopczyńska-Kaiser (1984), Malendowicz (1984), Nartowska (1986), Bogdanowicz (1991, 1992), Gąsowska, Pietrzak-Stępkowska

(1994), Healey (2003) and on the basis of our professional experiences. The *Chart of Assessment of Handwriting and Letter-like Designs Karta* was constructed using the studies by Wróbel (1980, 1985), Borysowicz et al. (1991) and Ajuriaguerra's dysgraphic scale.

The characteristics of the course of graphomotor activities take into account the following categories of description: I. THE DOMINANT HAND; II. THE WAY OF HOLDING THE WRITING INSTRUMENT (GRIP); III. THE DOMINANT HAND ARRANGEMENT; IV. THE MOVEMENT OF THE DOMINANT HAND; V. THE AUXILIARY HAND; VI. THE POSITION OF THE SHEET; VII. THE SITTING POSITION; VIII. THE PACE OF WRITING. The analysis of products of graphomotor activities – reproduction of letter-like designs and copied texts – covers the following categories of description of phenomena: I. THE WRITING LINE (a/ force of the writing instrument; b/ line stability); II. LETTERS/ LETTER-LIKE DESIGNS (a/ form of letters/letter-like signs; proportions within a letter/letter-like signs); III. LETTER IN A WORD/ THE STRUCTURE OF A LETTER-LIKE DESIGN (a/ size and slant of letters in words/of letter-like signs in designs; connections of letters in words/of letter-like signs in designs; IV. THE WRITING OF A TEXT/ LETTER-LIKE DESIGNS (a/ direction (slant) of writing/ letter-like designs; b/ size of writing/letter-like designs; V. VERSE ORGANIZATION (a/ spaces between words/elements of letter-like designs; b/ keeping the writing within line rulings/ keeping letter-like designs within line rulings; VI. ORGANIZATION OF THE PAGE (a/ positioning of the text/designs on the page; b/ margins).

HANDWRITING AND LETTER-LIKE DESIGNS IN LIGHT OF OUR OWN STUDIES

Since the kinds of products of graphomotor activities were varied (here: reproductions of letter-like designs – copied texts), the analysis – in our own studies conducted on a group of 300 children aged 7–13 years (Domagała, Mirecka 2010b)¹ – covered:

- 1/ the graphic level of letter-like designs,
- 2/ the graphic level of handwriting,
- 3/ the relationship between the graphic level of letter-like designs and the graphic level of handwriting.

Statistical analysis showed positive correlations of results obtained in tests for reproduction of letter-like designs and tests for copying texts, for all age lev-

¹ Investigations were conducted as part of the research project “Written Communication Disturbances” (Project no. N N 106 1885 33 MNiSW [Ministry of Science and Higher Education]; project manager – Dr U. Mirecka, main project executors Prof. S. Grabias, Dr A. Domagała).

els, both in the groups of boys and girls – the total value for grades I to VI being 0.8. The results of the analysis are shown in Table 1.

Table 1. Reproduction of letter-like designs versus handwriting. Results obtained using the *Profile of Graphomotor Skills* (here: the *Chart of Assessment of Handwriting and Letter-like Designs*)

Grade (level of education)		Mean value in tests for reproduction of letter-like designs	Mean value in tests in tests for copying texts	Results correlations in tests for reproduction of letter-like designs and copying texts
I	Total	17.54	19.94	0.7187
	M	20.68	23.92	0.6730
	F	14.40	15.96	0.5990
II	Total	24.28	25.24	0.5606
	M	25.20	25.32	0.5994
	F	23.36	25.16	0.5424
III	Total	28.60	27.34	0.7515
	M	32.20	30.68	0.7543
	F	25.00	24.00	0.6846
IV	Total	35.66	40.24	0.8612
	M	42.92	50.32	0.8199
	F	28.40	30.16	0.7839
V	Total	34.98	34.36	0.8638
	M	41.40	44.00	0.8500
	F	28.56	24.72	0.7159
VI	Total	32.72	38.64	0.5885
	M	35.72	45.72	0.5568
	F	29.72	31.56	0.4894
I-III	Total	23.47	24.17	0.7179
	M	26.03	26.64	0.8590
	F	20.92	21.71	0.6821

IV–VI	Total	34.45	37.75	0.7741
	M	40.01	46.68	0.7444
	F	28.89	28.81	0.6394
I–VI	Total	28.96	30.96	0.8043
	M	33.02	36.66	0.8273
	F	24.91	25.26	0.6923

The obtained results show that there is a relationship between the kinds of graphomotor activities (writing, drawing designs). Consequently, if necessary, the assessment of graphomotor skills in the basic aspect can be made based on reproductions of letter-like designs, which is particularly helpful in diagnosing children who have not yet begun to learn to write, have learned to write at an elementary level, or have reading problems. The quality of performing the tests for copying simple designs can provide important information on the development of graphomotor skills in a child, and help to notice symptoms of developmental disorders in the optimal time.

In logopedic practice, special attention should, however, be paid to children with multiple disabilities, in whom the graphic level of letter like designs and the graphic level of handwriting can be varied because of the manifestation – in particular cases – of different phenomena determined by the specificity of verbal and written communication disorders (Domagała, Mirecka 2011).

EXEMPLIFICATION OF THE PROBLEM

The assessment of products of graphomotor activities in the *Profile of Graphomotor Skills* (Domagała, Mirecka 2010c, 2012b) is based on handwriting samples (copying texts) and on samples of letter-like designs (reproducing designs). The tests use equivalent sets of letter-like designs to be reproduced (taking into account simple designs and designs of greater structural complexity) and texts to be copied (diversified with respect to language, themes, and text length).

Example 1.

The assessment of graphomotor skills in an 8-year-old girl diagnosed as needing special education for children with multiple disabilities on the basis of the samples of copied texts and of reproduction of letter-like designs (additionally: a carbon copy of the copied text to assess the pressure of the writing instrument). The data from specialist diagnosis: infantile cerebral palsy – left-sided pyramidal hemiparesis, mild mental retardation (predominant verbal intelligence over

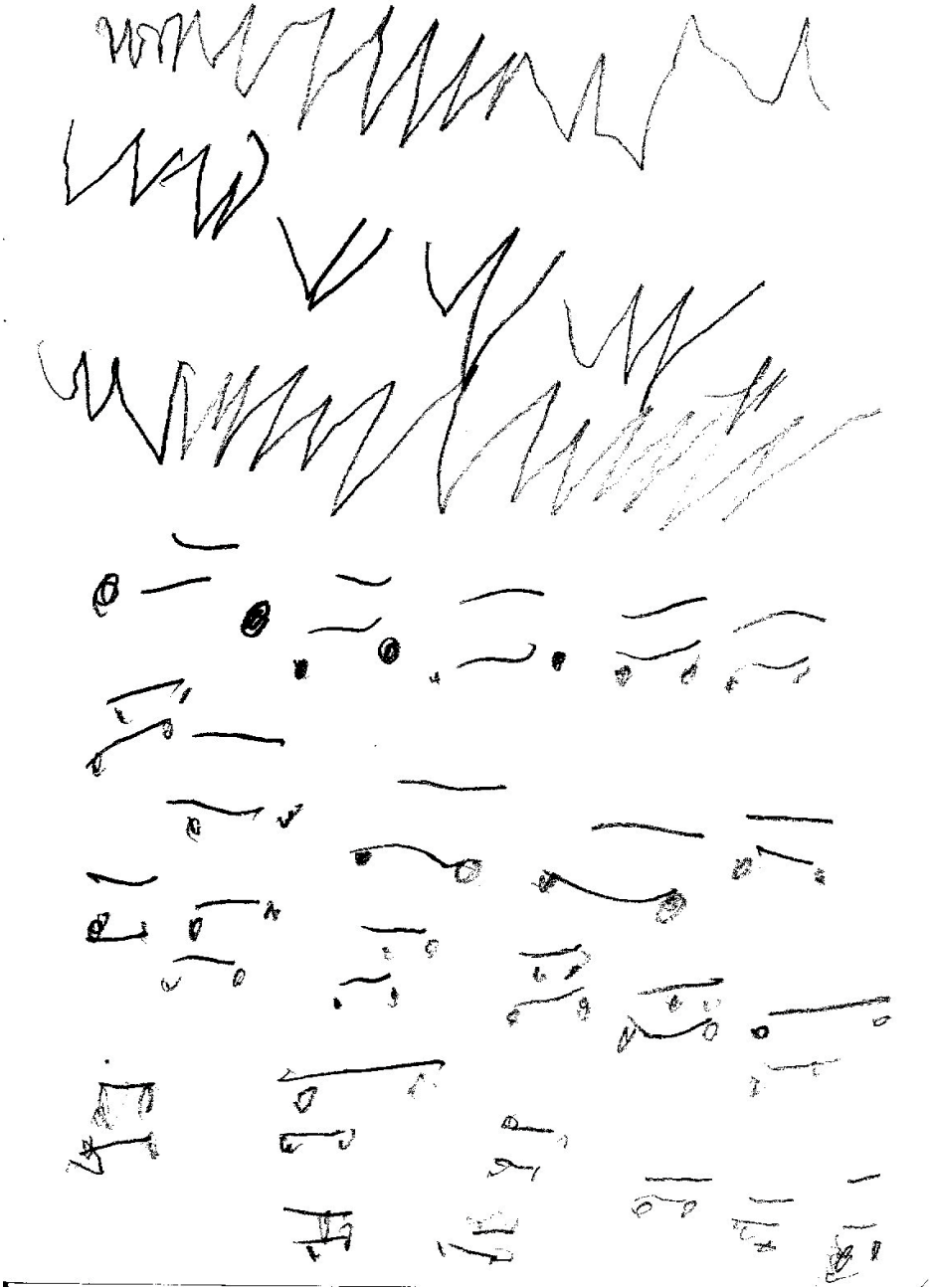
non-verbal, speech defects, poor perceptiveness and visual memory, poor visual-motor coordination, a diminished level of graphomotor activities, direct auditory memory – normal.

five
that glass creation
beginning of tenor
franklin
provision

Sample no. 1a. The text copied on a lined sheet.

five
that glass creation
beginning of tenor
franklin
provision

Sample no. 1b. The text copied on a lined sheet – a carbon copy.



Sample no. 1c. Reproduction of letter-like designs on a lined sheet.

In this case the graphic level of handwriting is higher than the level of reproduction of letter-like signs (illustrated by the samples: 1a. The text copied on a lined sheet; 1b. The text copied on a lined sheet – a carbon copy; 1c. Reproduction of letter-like designs on a lined sheet), which can be seen as a result of intensive writing exercises, without having learned the ability to copy abstract designs/figures due to diminished cognitive abilities (here: particularly non-verbal intelligence).

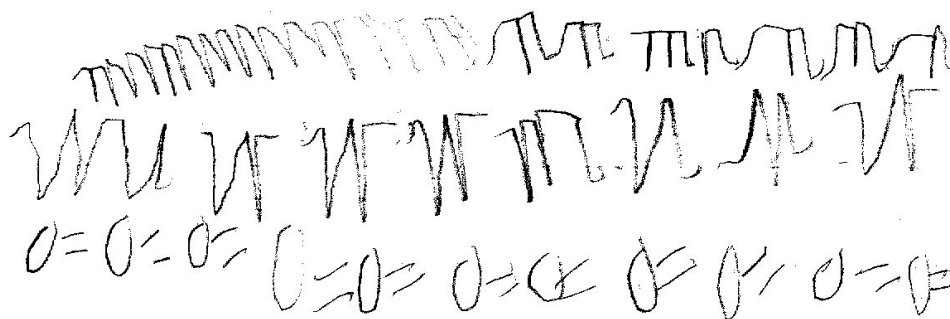
Example 2.

The assessment of graphomotor skills in an 8-year-old boy diagnosed as needing special education for children with motor disability on the basis of reproductions of letter-like designs (reading difficulties prevented the child from taking the test for text copying). The data from specialist diagnosis: infantile cerebral palsy – spastic quadriplegia, mental development – within the norm, disorders of visual perception, disordered visual-motor coordination, a very low level of graphomotor activities, normal auditory perception, and spastic dysarthria.



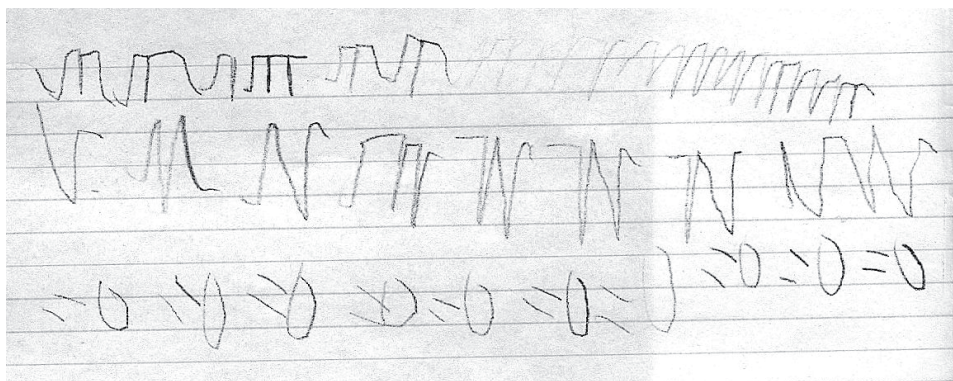
A sample of handwritten text on an unlined sheet. The text consists of the characters 'nyokaz na' written in a cursive, somewhat irregular style. The letters are connected and show some slanting and uneven spacing.

Sample no. 2a. Text copied on an unlined sheet.



A sample of reproduced letter-like designs on a lined sheet. The designs are arranged in three rows. The top row consists of a series of connected, wavy, horizontal lines. The middle row consists of a series of connected, wavy, horizontal lines that resemble the letter 'W' or 'M'. The bottom row consists of a series of connected, wavy, horizontal lines that resemble the letter 'O' or 'C'.

Sample no. 2b. Reproduction of letter-like designs on a lined sheet.



Sample no. 2c. Reproduction of letter-like designs on a lined sheet – a carbon copy.

In this case the level of reproduction of letter-like signs is higher than the graphic level of handwriting (illustrated by the samples: 2a. Text copied on an unlined sheet; 2b. Reproduction of letter-like designs on a lined sheet 2c. Reproduction of letter-like designs on a lined sheet – a carbon copy). The boy is learning the reading and writing skill with difficulty in the course of school education; in contrast, he finds it easier to copy letter-like designs because of the non-linguistic character of the task.

CONCLUSION

Our own studies, conducted on a population of 300 children – primary school pupils, showed positive correlations of the results obtained for all age levels in tests for reproduction of letter-like designs and tests for copying texts. Nevertheless, in individual cases, particularly in children with multiple disabilities, multi-faceted diagnostic procedures make it possible to identify a varied level of graphomotor skills depending on the nature of the task (linguistic/non-linguistic). The use of letter-like designs in clinical diagnosis provides an opportunity to assess graphomotor skills on non-linguistic material in children with multiple disabilities.

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