

ANETA DOMAGAŁA, URSZULA MIRECKA

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

ORCID ID: <https://orcid.org/0000-0001-5955-5164>, <https://orcid.org/0000-0002-2515-8205>

Graphomotor Skills in Children Carrying out the One-Year Preschool Preparation Obligation – the Need of Wide Range Assessment

SUMMARY

The article investigates the issue of graphomotor skills assessment in children carrying out the one-year preschool preparation obligation. On the basis of the findings included in the academic literature and of the own empirical research, the need of developing wide range diagnostic tools for the graphomotor skills assessment in children below mandatory school age has been pointed out. The range of graphomotor skills assessment in children carrying out the one-year preschool preparation obligation was determined; our own proposal, relevant to graphomotorics at two complementary levels was presented: the course and products of graphomotor skills in accordance with the proposed interpretation of phenomena, with the multidimensional assessment of each of them. New technique of diagnosing “The Profile of Graphomotor Skills. Version for children carrying out the one-year preschool preparation obligation” is currently being conducted in collaboration with the Psychological and Pedagogical Tests Lab in Gdansk.

Key words: diagnosis; graphomotor skills; school maturity; one-year preschool preparation; early education

INTRODUCTION

The object of the paper is graphomotor skills of children carrying out the one-year preschool preparation obligation. Difficulties in the area of graphomotor skills (here: essentially, writing difficulties) are a significant barrier in school education and in the future occupational and personal life of an individual. The analysis of theoretical problems concerning the assessment of graphomotor

skills at the preschool stage and proposal of practical solutions determines better support for children in their development in this field, better preparation for school education, and new forms of aid to those in need.

Currently, a new technique for graphomotor skills assessment in children carrying out the one-year preschool preparation obligation is being prepared by the authors of the paper. On account of the age of the subjects, the planned diagnostic tool (ultimately as a test after normalization has been completed) will complement the methods of specialist diagnosis in the sphere of graphomotor skills – the previously developed tools for 1st to 6th grade primary school students:

- a) “Profile of Graphomotor Skills” (Domagała and Mirecka, 2010b) – the technique of diagnosing children aged 7-13, developed on the basis of empirical studies conducted by the authors in a group of 300 first-to-sixth-grade primary school students;
- b) The normalized “Scale of Graphomotor Skills Assessment” (Domagała and Mirecka, 2017d), developed by the authors based on the “Profile of Graphomotor Skills” in collaboration with the Psychological and Pedagogical Tests Lab in Gdansk – the Laboratory conducted normalization tests with ca. 1000 first-to-sixth-grade primary school students all over the country.

The foregoing tools are now widely used in specialist outpatient clinics all over Poland (they can be utilized by teachers, psychologists, and speech therapists/logopedists). However, there is no tool for a comprehensive assessment of graphomotor skills at the preparatory stage for school education (which was shown by the survey of diagnostic methods – Domagała and Mirecka, 2015c, 2016). At the same time, of crucial importance today is the suitability of diagnostic tools with regard to the new system solutions adopted in education (Kwaśniewska, Lenzion and Żaba-Żabińska, 2018).

The investigation of the problems of graphomotor skills in children before they start school education, taking the work on a new diagnostic tool into consideration, is the consequence of research work carried out earlier. Experts assessed that the previously developed diagnostic technique for children aged from 7 to 14, “The Profile of Graphomotor Skills” (Domagała and Mirecka, 2010b), is the only available contemporary tool for studying the graphomotor sphere, which may *inter alia* be an element of the assessment of school readiness (Krasowicz-Kupis, Wiejak and Gruszczyńska, 2015), in the circumstances when there is no such tool addressed for children at preschool age. Bearing this in mind, the authors decided to prepare a tool directly for studying younger children, adapted for the stage preceding learning to write. This enabled the proposed interpretation of graphomotor skills (Domagała and Mirecka, 2015a, 2017b). The earlier empirical studies show the relationship between such kinds of graphomotor activities as writing and drawing patterns; consequently, the assessment of graphomotor skills in the basic

dimension can be made on the basis of tests for reproduction of letter-like designs, which is particularly helpful in diagnosing which child has not yet begun learning to write or have learned to write at an elementary level (Domagała and Mirecka, 2014/2015, 2015a).

GRAPHOMOTOR SKILLS IN CHILDREN – THE NEED OF WIDE RANGE ASSESSMENT

Our own earlier empirical investigations in a group of students aged 7–13 (Domagała and Mirecka, 2015a), and subsequently also the normalization research concerning “The Scale of Assessment of Graphomotor Skills” (Domagała, Mirecka, 2017d) revealed a number of undesirable phenomena with regard to the course and products of graphomotor skills: some can be thought of as being caused by the lack of appropriate patterns of training at the earliest stage of development of graphomotor skills. The data on the course of graphomotor activities informs, for example, that in the age range of 7–13 years, 42% children have the incorrect hold of the writing instrument, 36% do not keep the correct distance of the finger from the writing tip, 41% are characterized by the incorrect body posture while performing graphomotor activities, 80% are characterized by the incorrect head position, 32% do not have a stable position on the chair, and 28% work irregularly (slowing down, quickening the pace, working with clear signs of fatigability, with long or frequent interruptions). Disturbing findings also concern the products of graphomotor activities, for example, 40% of students are characterized by the hesitant line while writing down the text (shaky line, abnormalities, line distortions), the products of 40% of children exhibit the incorrect pressure of the writing instrument (the writing trace is too strong, too weak, variable), 75% of students do not maintain the correct and esthetic form of letters.

A high percentage of undesirable phenomena was found in the earliest period of school education, in first-grade pupils: a detailed assessment of graphomotor skills at this stage of education showed in most children the abnormalities concerning the body posture and the manner of holding the writing instrument; almost half the children also manifested difficulties with positioning of the sheet with patterns for reproduction/text to be copied in relation to the body axis and the desk edge while performing graphomotor activities (Domagała and Mirecka, 2017a). Since the abovementioned empirical studies were conducted at the end of the school year (i.e. after a year of school), the fear that the reported abnormalities will become permanent in the students appears to be justified. In the context of the results achieved by first-grade primary school students, the authors suggested the need to take preventive measures before the pupils begin school; the desirable behavior in the sphere of graphomotor skills should be shaped in the preschool

period (here: in respect of such graphomotor activities as drawing pictures or decorative bands and letter-like designs), which will make it possible to prepare the child properly for subsequently learning to write. In our cultural circle the optimum conditions for writing are provided by writing with the right hand; special attention should be devoted to left-handed children (in our own studies their percentage in the first grade was relatively high, amounting to 12%). What is more, our own studies found gender-dependent differences: girls had better results than boys in terms of products of graphomotor activities (in all the studied categories of phenomena), but as far as the course of graphomotor activities was concerned this regularity was not reported (in some categories girls achieved better results than boys /e.g. the cooperation of hands while performing graphomotor activities, positioning of the sheet in relation to the body axis and the edge of the desk/, and in some cases – worse results /e.g. the way of holding the writing instrument/).

The consequence of demonstrating during empirical studies the multiple problems in the area of graphomotor skills in first-grade primary school students (and in higher-grade students whose problems are often intensified with the growing school requirements concerning e.g. the pace of writing, the time of working during the lesson – Domagała, 2012, Domagała and Mirecka, 2017e) is the inquiries into the causes of this state, inter alia into the determinants of the development of graphomotor skills in the period prior to learning to handwrite.

The studies of the graphomotor skills of children at different levels of education (at two complementary levels: the course and products of graphomotor skills in accordance with the proposed interpretation of phenomena) have been systematically conducted by the project authors since 2007 (inter alia taking into consideration the problems of longitudinal assessment in younger-school age students / Domagała and Mirecka, 2017e/ or the individualization of diagnostic procedures for graphomotor disorders in children with neurological conditions, who have not learned to write to a sufficient degree /Domagała and Mirecka, 2017c/).

At the level of the one-year preschool preparation, graphomotor skills were studied in a planned way as part of M. Majcher's MA thesis "Sprawności grafomotoryczne dzieci 6-letnich" [Graphomotor Skills in Six-Year-Old Children] (Logopedics with Audiology program, Maria Curie-Skłodowska University in Lublin – Supervisors: the authors of the paper). Empirical studies using the experimental-clinical trials (devised by the supervisors) planned in the present project were carried out in a group of 20 children after they completed the one-year preschool preparation. A part of the testing of each child was recorded with a camera, by means of which the audiovisual material was obtained to analyze the phenomena from the angle of the course of graphomotor activities. In this area, the results of tests showed that the most frequent difficulties found in children were those that concerned the way of holding the writing instrument (here: various improper positions of the thumb, index finger and middle finger; usually a too small dis-

tance of the finger from the writing tip) and the sitting position (here: usually the excessive bending of the trunk and the head, and leaning of the whole trunk on the desk or holding of the head too close to the sheet). The children often worked fast but the course of graphomotor activities was incorrect: the proper patterns were not learned. With regard to the products of graphomotor activities a number of different irregularities were recorded within each of the studied categories of the phenomena. One of the principal problems turned out to be the pressure of the writing instrument (here: usually a too strong writing trace or the changing strength of the writing trace as shown in the assessment using carbon-copies of reproduced designs). A valuable source of information about difficulties in the course of drawing designs were final conversations with the children (after diagnostic tests were carried out in accordance with the suggestions in literature on the subject, e.g. Gruszczyk-Kolczyńska, 2011). The children most often reported the fatigability of the hand while working. Additionally, preschool education teachers were interviewed about the difficulties the children encounter while preparing to learn to write (impossibility of monitoring individual behaviors of children during group activities). Wyniki tych badań częściowo zaprezentowano w osobnym artykule (Domagała, Mirecka, Majcher, 2018).

We assess the current knowledge on graphomotor skills in children starting school as fragmentary: studies on the subject are seldom conducted, being usually confined to narrow aspects of the phenomenon (e.g. Grzesiak, Naskręt and Bronikowski, 2014), or are one of the elements for assessing school maturity/school readiness (e.g. Buchnat, 2013; Grzywniak, 2013; Skibska, 2014; Chojak, 2016). In diagnosing the readiness to learn writing, graphomotor skills are assessed based on drawing tests, mainly on copying graphic shapes, simple or complex geometric figures, and asymmetrical abstract linear compositions (e.g. Bogdanowicz, 2003; Tryzno, 2008; Wilgocka-Okoń, 2010; Bogdanowicz and Kalka 2011; Korendo and Cieszyńska, 2012): the diagnostician relies first of all on the assessment of the product. The observation of the child while s/he is performing graphomotor activities is limited (which was indicated in the previous characterization of graphomotorics in the context of logopaedics – Domagała, Mirecka, 2017b). In our opinion, the assessment of graphomotor skills in children should be significantly extended. It is necessary to depart from focusing on the product in assessing graphomotor skills (as imposed by definitions of dysgraphia that reduce it to the lower legibility/illegibility of a written text and lack of esthetics /e.g. Bogdanowicz, Bucko and Czabaj, 2008/ and as generally perceived by teachers and parents) and depart from the general assessment of graphomotor skills (as proposed by popular tools oriented towards comprehensively diagnosing school maturity/school readiness, e.g. Janiszewska, 2012) for a multifaceted assessment.

In relation to the course of graphomotor activities too little account is taken of the fact the development of writing abilities in motor terms depends not only

on manual efficiency (especially on manipulating the writing instrument) but also on the performance of gross motor skills (especially on movement coordination, the ability to cross the body midline), on correct kinesthesia (the awareness of the position of the body in space), appropriate muscular tone, and the correct stability of the joints associated, directly or indirectly, with the writing activity; owing to these factors, motor patterns are learned, which results in the automation of the writing process (see St. John, 2013). In literature in English it is pointed out that the graphomotor skills level has decreased because of the physical aspect of handwriting: the motor coordination disorders, slow pace of motor activities, and inability to remember necessary movements to form letters observable in children are the cause of problems with correctly writing letters, with esthetic writing, maintaining the writing within the lines, with spacing and organization of writing on the sheet, with copying from the blackboard/from the book, or with precise and fast writing; studies on pupils with diagnosed dysgraphia also show the wrong handgrip, the incorrect position of the wrist and body posture, the incorrect position of the sheet, confusion of block letters/italics and capital/small letters, the irregular size, shape and slant of letters (Rief and Heimburge, 2007).

In English literature the term graphomotor skills refers first of all to the drawing and handwriting skills: it is stressed that these activities serve to consolidate/record experience, ideas as well as to communicate with the social environment (Ziviani and Wallen, 2006). In our interpretation, graphomotor difficulties in preschool children (in the long term concerning basic school abilities – difficulties in handwriting) are closely connected, in the field of education, with written communication disorders. In the context of specific writing difficulties, we believe that it is not beneficial for the pupils if graphomotor skills are placed outside the field of developmental dyslexia (more broadly: outside specific learning disorders) as it has been adopted in the most recent DSM-5 classification (Kryteria diagnostyczne z DSM-5®. Desk reference, 2015) – difficulties in handwriting are classified into the category of developmental coordination disorder - 315.4, placed within motor disorders; writing is put here on an equal footing with such activities as the use of cutlery or riding a bicycle). From the standpoint of written communication the activity of writing is based on graphomotor and spelling skills combined together (at this point it should be emphasized that graphomotor difficulties can adversely impact the development of spelling skills – Domagała and Mirecka, 2010a, 2011).

SCOPE OF THE ASSESSMENT OF GRAPHOMOTORICS IN CHILDREN CARRYING OUT THE ONE-YEAR PRESCHOOL PREPARATION OBLIGATION – OUR ORIGINAL PROPOSAL

The graphomotor sphere is of fundamental importance for the social functioning of a human: his/her education and personal development. Lending so much importance to graphomotor skills, we propose the following in current studies:

- to assess the graphomotor skills of children carrying out the one-year preschool preparation obligation – on two complementary levels: in terms of the course of graphomotor activities consisting in reproduction of letter-like designs and in terms of products of graphomotor activities,
- to conduct a multidimensional assessment of graphomotor skills on both levels: in terms of the course of graphomotor activities, taking into account normative and undesirable phenomena concerning the dominant (guiding) hand and auxiliary hand, the way of holding the writing instrument, the position of the sheet as well as the pace of work; and in terms of products of graphomotor activities, taking into account normative and undesirable phenomena concerning the pressure of the writing instrument, line stability, the form and proportion of letter-like designs, their size and slant, combination of letter-like designs in patterns, as well as the organization of the line and sheet. In order to assess the writing trace, the basic skill of drawing a line, it was planned to obtain carbon-copies of the children's design reproductions.

The children is individually tested at each stage.

The procedure of testing takes the following into account:

I. In contact with the child:

- 1) A preliminary conversation with the child meant to start interaction with the subject and prepare him/her for taking diagnostic tests.
- 2) The conduct of diagnostic tests.
- 3) A final conversation with the child in order to obtain information from the subject on the performed tasks (the easiness of the tasks, or possible difficulties during the tests) and to thank the child for taking part in the tests.

II. After the child has been tested:

- 1) Analysis of information recorded in the "Observation Protocol" while testing the child, and making of the final assessment of the course of graphomotor activities.

- 2) Analysis of the obtained samples of letter-like designs by categories of the description of phenomena specified in the “Chart of Assessment of Products of Graphomotor Activities”, and making of the final assessment of graphomotor products.

At the current stage of studies the diagnostic testing of the child (pt. I. 2) consists of the following experimental-clinical tests:

- 1) Reproduction of a letter-like design that has to be completed.

The child’s task is to complete a decorative border: on a ruled notebook page without a margin there is a fragment of pattern (its five single, identical elements: mutually linked wavy signs, rounded off as e.g. in the case of the letter “U”). A carbon paper is inserted between notebook pages in order to obtain a carbon copy on the reverse of the page on which the child has reproduced the pattern (for later assessment of the sample by the category of the description of phenomena specified in the “Chart of Assessment of Products of Graphomotor Activities” – pt. II. 2).

- 2) Reproduction of a letter-like design. It requires copying the pattern presented to the child onto a separate sheet.

The child’s task is to copy the pattern on a notebook-size page (without ruling and a margin), positioned at the top of the page – it is a broken pattern containing elements in the form of small sticks and loops like e.g. in letters “I” and “e”). A carbon paper is inserted (as in test 1) between notebook pages, on which the child is drawing the pattern. The sheet with the pattern to be copied is placed in front of the child, on the body mid-line.

- 3) Reproduction of letter-like designs, which requires copying the patterns presented to the child on a separate sheet.

The child’s task is to copy patterns on a notebook-size page (without ruling and a margin), positioned at the top of the page – they are two patterns: continuous and broken, containing elements in the form of ovals, vertical and diagonal lines, or sticks – resembling: “M”, „O”, “I”). A carbon paper is inserted between notebook pages, on which the child is drawing a pattern (as in earlier tests). The sheet with the pattern to be copied is placed in front of the child, on the body mid-line.

The individual assessment of the child made after ending the test comprises:

- 1) The assessment of the course of graphomotor activities in accordance with the diagnostic procedure defined in the “Observation Protocol”, taking into account the most significant phenomena concerning graphomotor skills as part of the following assessment categories:

- I. The dominant (guiding) hand
- II. The way of holding the writing instrument
- III. The dominant (guiding) hand arrangement
- IV. The auxiliary hand
- V. The position of the sheet
- VI. The sitting posture
- VII. The pace of graphomotor activities

The assessment of the pace of graphomotor activities work is made during the test based on measuring the time of execution of each individual test by the child (and the total time of execution of all tests by the child).

The assessment of the course of graphomotor activities in terms of the other categories is made directly after the testing of the child and it is an assessment by points.

- 2) The assessment of the products of graphomotor activities in accordance with the diagnostic procedure defined in the “Chart of Assessment of Products of Graphomotor Activities” taking into account the most significant phenomena concerning graphomotor skills – in terms of the following assessment categories:
 - I. The writing line (the pressure of the writing instrument, line stability)
 - II. Letter-like signs (the form of letter-like signs, proportions within a letter-like sign)
 - III. A letter-like sign in the design structure (the size of letter-like signs in the design structure, their slant, combinations of letter-like signs in designs)
 - IV. Writing down of letter-like designs (the slant of letter-like designs, the size of letter-like designs)
 - V. Verse organization (spaces between the constituent units of letter-like designs, maintaining of designs in the line)
 - VI. Page organization (the position of designs in the horizontal and vertical arrangement)

The assessment of products of graphomotor activities is an assessment by points.

In the test using “The Profile of Graphomotor Skills. A Version for children carrying out the one-year preschool preparation obligation” we obtain individual results for each child.

The tool will enable the identification, at the time appropriate for the child (before starting school education, here, basically: learning to write), of his/her abilities and limitations in the sphere of graphomotor skills (emerging difficulties, undesirable behavior that should be eliminated).

CONCLUSION

The need for preparation of a new tool on the basis of empirical studies corresponding with the current realities of the educational system in Poland is emphasized by the existing state of knowledge on the development of graphomotor skills in children, on the ways of diagnosing difficulties in this field and on the post-diagnostic procedure.

New technique of diagnosing “The Profile of Graphomotor Skills. The version for children carrying out the one-year preschool preparation obligation is currently being developed and prepared to the process of standardization, which is planned in collaboration with the Psychological and Pedagogical Tests Lab in Gdansk.

The tools applied will provide data on the level of graphomotor skills in children preparing for school education. Wide range assessment is enabled by considering graphomotorics at two complementary levels: the course and products of graphomotor skills in accordance with the proposed interpretation of phenomena with the multidimensional assessment of each of them.

BIBLIOGRAPHY

- Bogdanowicz M., 2003, *Ryzyko dysleksji. Problem i diagnozowanie*, Gdańsk, Wydawnictwo Harmonia.
- Bogdanowicz M., Bućko A., Czabaj R., 2008, *Modelowy system profilaktyki i pomocy psychologiczno-pedagogicznej uczniom z dysleksją*. Gdynia: Wydawnictwo Pedagogiczne OPERON.
- Bogdanowicz M., Kalka D., 2011, *Skala Ryzyka Dysleksji dla dzieci wstępujących do szkoły. SRD-6*. Gdańsk: Pracownia Testów Psychologicznych i Pedagogicznych.
- Buchnat M., 2013, *Gotowość szkolna dzieci sześciolatków ze specjalnymi potrzebami edukacyjnymi uczniów pierwszej klasy szkoły podstawowej*, Studia Edukacyjne 25, 115–136.
- Chojak M., 2016, *Rodzice a gotowość szkolna dzieci*, Lublin, Wydawnictwo UMCS.
- Domagała A., 2012, *Symptomatology of Graphomotor Disorders – Situational Determinants and Assessment Difficulties*, Logopedia, 41, 143–158 [edycja cyfrowa: www.logopedia.umcs.pl].
- Domagała A., Mirecka U., 2010a, *Grafomotoryka a kształtowanie się sprawności ortograficznych. Problemy w edukacji szkolnej*, Annales UMCS sectio FF Philologiae, XXVIII, 1, 99–111.
- Domagała A., Mirecka U., 2010b, *Profil sprawności grafomotorycznych*, Gdańsk: Pracownia Testów Psychologicznych i Pedagogicznych.
- Domagała A., Mirecka U., 2011, *Trudności grafomotoryczne ucznia wyzwaniem dla nauczyciela języka obcego*, Neofilolog, 36, 209–221.
- Domagała A., Mirecka U., 2014/2015, *Handwriting and Letter-Like Designs in the Clinical Assessment of Children with Multiple Disabilities*, Logopedia, 43/44, 99–107 [edycja cyfrowa: www.logopedia.umcs.pl].
- Domagała A., Mirecka U. (2015a). *Grafomotoryka u dzieci w wieku 7-13 lat* (wyd. 2 rozszerzone). Lublin: Wydawnictwo UMCS.
- Domagała A., Mirecka U., 2015b, *Testy przesiewowe do badania umiejętności czytania i pisania. Nowa Audiofonologia*, 4 (4), 45–50.

- Domagała A., Mirecka U., 2016, Metody diagnostyki i rehabilitacji trudności w czytaniu i pisaniu. *Nowa Audiofonologia*, 5 (2), 53–61.
- Domagała, A., Mirecka, U. (2017a). *Handwriting in the computer age. Technique of graphomotor activities in pupils beginning primary school – experimental studies*, EDULEARN17 Proceedings, (ed.) L. Gómez Chova, A. López Martínez, I. Candel Torres, Barcelona: IATED, 5550–5555.
- Domagała A., Mirecka U., 2017b, *Komunikacja pisemna i jej zaburzenia w perspektywie logopedycznej*, [w:] A. Domagała, U. Mirecka, (red.). *Zaburzenia komunikacji pisemnej* (87–109). Gdańsk: Wydawnictwo Harmonia Universalis.
- Domagała, A., Mirecka, U. (2017c). Procedura diagnozowania zaburzeń grafomotorycznych u dzieci ze schorzeniami neurologicznymi – propozycja własna. W: G. Jastrzębowska, J. Góral-Półrola, A. Kozolub, (red.). *Neuropsychologia, neurologopedia i neurolingwistyka*. Opole: Wydawnictwo UO, 493–505.
- Domagała, A., Mirecka, U. (2017d). *Skala oceny sprawności grafomotorycznych SOSG*, Gdańsk: Pracownia Testów Psychologicznych i Pedagogicznych.
- Domagała, A., Mirecka, U. (2017e). Zastosowanie „Profilu sprawności grafomotorycznych” w badaniach longitudinalnych. W: D. Pluta-Wojciechowska, B. Sambor (red.). *Współczesne tendencje w diagnostyce i terapii logopedycznej* (249–264). Gdańsk: Wydawnictwo Harmonia Universalis.
- Domagała A., Mirecka U., Majcher M. (2018). Trudności w zakresie przebiegu czynności grafomotorycznych u dzieci z klas I oraz dzieci realizujących obowiązek rocznego przygotowania przedszkolnego, *Logopedia*, 47, 155–168.
- Gałecki, P., Świąćicki, Ł. (2015). *Kryteria diagnostyczne z DSM-5®. Desk reference*. Wrocław: Edra Urban & Partner.
- Gruszczyk-Kolczyńska, E. (2011). *Nauczycielska diagnoza gotowości do podjęcia nauki szkolnej*. Kraków: Centrum Edukacyjne Bliżej Przedszkola.
- Grzesiak, J., Naskręt M., Bronikowski M. (2014). Znaczenie koordynacji ruchów ręki w kształtowaniu umiejętności grafomotorycznych u dzieci w wieku 6–7 lat. *Rozprawy Naukowe Akademii Wychowania Fizycznego we Wrocławiu*, 47, 131–139.
- Grzywniak, C. (2013). *Dojrzałość neuropsychologiczna do szkolnego uczenia się dzieci sześciu- i siedmioletnich*, Kraków: scriptum.
- Janiszewska, B. (2012). *Diagnoza dojrzałości szkolnej*. Warszawa: WSiP.
- Korendo, M., Cieszyńska, J. (2012). *Test do badania zagrożenia dysleksją SWM*. Kraków: Wydawnictwo Metody Krakowskiej.
- Krasowicz-Kupis, G, Wiejak, K, Gruszczyńska, K. (2015). *Katalog metod diagnozy rozwoju poznawczego dziecka na etapie edukacji przedszkolnej i wczesnoszkolnej*. Warszawa: Instytut Badań Edukacyjnych.
- Kwaśniewska M., Lendzion J., Żaba-Żabińska W. (2018). *Wokół przedszkola. Program edukacji przedszkolnej oparty na warstwicowej koncepcji wychowania Stefana Kunowskiego*. Kielce: Grupa MAC S.A.
- Rief, S.F., Heimburge, J.A. (2007). *How to Reach and Teach All Children Through Balanced Literacy. User-friendly strategies, tools, activities, and ready-to-use materials*. San Francisco, CA: Jossey-Bass.
- Skibska J., 2014, *Umiejętności dzieci 6-letnich rozpoczynających edukację w klasie I – komunikat z badań*, [w:] E. Jezierska-Wiejak, J. Malinowska (red.) *Dziecko w sytuacjach uczenia się: konteksty i przestrzenie edukacyjne* (171–186). Wrocław: Oficyna Wydawnicza Atut – Wrocławskie Wydawnictwo Oświatowe.
- St. John S., 2013, *Factoring in Fine Motor: How Improving Fine Motor Abilities Impacts Reading and Writing*, Illinois Reading Council Journal, 41(4), 16–24.

- Ziviani I., Wallen M., 2006, *The Development of Graphomotor Skills*, [w:] A. Henderson, C. Pehoski (red.), *Hand Function in the Child: Foundations for Remediation* (217–238). St. Louis, MO: Mosby Elsevier.
- Tryzno E., 2006, *Diagnoza edukacyjna dzieci 6-, 7-letnich rozpoczynających naukę (wersja po badaniach pilotażowych)*, Gdańsk: Wydawnictwo Harmonia Universalis.
- Wilgocka-Okoń B., 2010, *Gotowość szkolna dzieci sześcioletnich*, Warszawa: Wydawnictwo Akademickie Żak.