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Logopaedic diagnosis of children with cortical based speech and language development disorders

SUMMARY

Formulation of a logopaedic diagnosis with regard to children with developmental disorders of speech and language caused by trauma and/or malfunction of CNS requires thorough and long-term examination. The diagnostic process involves performance of tests that check the level of comprehension, ability to formulate utterances and the functioning of processes enabling language acquisition, i.e. phonematic hearing, articulatory kinesthetics, auditory memory. In order to make diagnostic decisions it is often important to consider the dynamics of changes in the level of speech development of a child which is observed along the process of improvement.

Key words: logopaedic diagnosis, delayed language development (speech development retardation), speech underdevelopment of aphasic type, speech underdevelopment of cortical type, developmental aphasia of children, phonematic hearing, articulatory kinesthetics, auditory memory.

CORTICAL DISORDERS IN SPEECH AND LANGUAGE DEVELOPMENT – EXPLANATION OF THE TERM

Diagnosis of children with deep developmental disorders of speech and language is a very current issue in Polish studies on speech therapy. Such abnormalities are often called *specific* as they are represented – at least at the beginning of a child's development – by isolated difficulties within the scope of spontaneous and natural language acquisition as compared with normal motor, emotional and social, as well as cognitive development of a child. The cause of abnormalities are anatomical damage and/or malfunctions of CNS, as a result of which

brain patterns of language behaviour develop significantly later and abnormally in case of such children (Herzyk, 1992; Mierzejewska, Emiluta-Rozya, 1998; Emiluta-Rozya, 2008). Characteristic symptoms of such disorders are difficulties of various degree – within the scope of understanding and the ability to produce utterances.

The time when a factor causing structural and/or functional changes occurs is important for differentiation of disorders into *developmental* and *acquired*. When the damage is done at a very early stage of a child's life, before or during acquisition of the ability to use language we are dealing with *developmental disorders*. If, however, the abnormality occurs after a child acquired the basics of a language the diagnosis is *acquired disorders*. In order to apply such differentiation it is necessary to refer to a developmental norm and definition of the age when a child acquires the basics of his or her mother tongue. Normal development of speech and language is divided into stages and each distinguished stage refers to a defined level of a child development [Zarębina, 1965; Kaczmarek, 1988; Porayski-Pomsta, 2015]. On the other hand, it is quite important to determine the age when a child should reach a given stage of development. It is acknowledged that the development of language communication begins at around 9th to 12th month of life and lasts until 10th and 12th month. The most dynamic development of language is between 18th-24th month of life and 36th month. At that time the vocabulary range of a child changes significantly, the form of a word and its connection to the meaning stabilizes, however, most importantly a child masters the basics of a language system: phonological, morphological and syntactical [Zarębina, 1980; Porayski-Pomsta, 2015]. It seems that reaching the age of 3 years can be assumed as the moment which separates *developmental disorders* from *acquired* ones. Nonetheless, one needs to take into account individual differences in children development. Therefore, the age criterion cannot be the only premise and it seems necessary to obtain knowledge as for the actual level of speech acquisition of a child at the time when the damage was done [Herzyk, 1992, Panasiuk, 2008].

The further part of the article describes disorders of developmental character.

Cortical disorders most often appear already at the beginning of language development of a child at about 1 year of age. Some children even use, similarly to their peers, a few words: *mommy, daddy, car, give*, onomatopoeic pronunciations: *xaw – xaw* [English: *wof - wof*]¹, *m'aw–m'aw*, however, later they do not enlarge their active vocabulary or it takes place very slowly. It does happen that children at the age of 2 or 3 years do not produce even such early utterances - *they do not speak*. Such children gradually develop language competence influenced by the applied facilitating activities, yet, the development is insufficient and does

¹ Translator's note

not achieve normative level. In the case of many children, with profound disorders, prognosis is unfavourable and abnormalities first detected in the case of a small child, are later also observed at young and adult age – not only in speech but also in reading and writing [Mierzejewska, Emiluta-Rozya, 1998; Emiluta-Rozya, 2013; Kurowska, 2015]. It should moreover be recognised that the range of symptoms characteristic to this disorder are manifested gradually as the language proficiency develops. At first, when the child does not speak at all or speaks very little the scope of abnormalities is very limited. As the speech development is more advanced, the range of abnormal language behaviours specific to *cortical disorders* becomes wider, i.e. paraphasia, changeability of reactions, perseveration, difficulties in actualisation, incorrect phonological and phonetic structure of words, incorrect inflection of nouns and verbs.

At first, in the case of younger children at the age of 1.5 to 2 years old, parents do not always notice difficulties in understanding speech. At the level of simple instructions, formulated in everyday, routine and repetitive situations, the child often reacts in a completely normal manner.

The term *cortical disorders* implies a specific – connected to language – character of the disorder. It is simultaneously a sign differentiating such disorders from others also conditioned by the brain and in which one can notice difficulties in verbal communication. Nonetheless, they are of different character and are a part of broad spectrum of symptoms coexisting with intellectual disability and/or autism. Among them are difficulties in: making and maintaining direct eye contact, concentration, undertaking group games – with children or adults – building, theme, role playing. The difficulties are accompanied by schematically repeated stereotypical and motor activities, and in speech – echolalia [Pisula, 2005].

NAMES OF DIAGNOSTIC UNITS

Modern literature on the subject presents many names of units which can be applied in recognizing symptoms indicating at *cortically conditioned speech and language disorders*. To name a few: *alalia*, *aphasic type underdevelopment of speech*, *underdevelopment of speech of cortical origin*, *motor disability*, *including aphasia*, *specific disorders in speech and language development*, *SLI Specific Language Impairment*, *DLD² Developmental Language Disorder* [Kordyl, 1968; Parol, 1989; Mierzejewska, Emiluta-Rozya, 1998 Grabias, 2001; Leonard, 2006; Panasiuk, 2008; Emiluta-Rozya, 2008; ICD-10; Regulation of the Minister of National Education dated 9.08. 2017]. Some of them are strongly rooted in scientific and research tradition of Polish logopaedia. Other stem from modern,

² In 2016, on the basis of work of CATALISE, a group of English-speaking experts, the name SLI was replaced by DLD [Low, et al. 2019].

international medical classifications or legal acts binding in the Polish system of education.

In *Logopedyczna klasyfikacja zaburzeń mowy [Logopaedic classification of speech disorders]*³ by S. Grabias, *alalia* is presented as disorder conditioned by undeveloped perceptive proficiency – most of all by malfunctioning phonematic hearing. The impairment is so profound that as a result the following competences do not develop at all or develop in a limited manner : linguistic, communicative, cultural [Grabias, 2001]. On the other hand, J. Panasiuk describes *alalia* and defines it as a speech disorder – resulting from a damage to CNS in a preverbal period, that is up to 1 year of age [2008]. Many publications provide reference to the term introduced in 1960s by Z. Kordyl. The author proposed a new name for speech disorders of children which results from a damage to CNS: *aphasic type underdevelopment of speech*. It is a descriptive term and as such describes the character of impairment in a more exact manner. It denotes incomplete speech development of a child and indicates at similarity of abnormalities noticed in the case of children to the symptoms present in aphasia of adults. Some additional clarification of the term connected with further indication of age between 2 and 6 years as the age when such impairment is diagnosed has been introduced by U. Parol and J. Panasiuk [1989; 2008]. Strive for more and more accurate definition of names for cortically conditioned developmental disorders is also visible in *Zestawienie form zaburzeń mowy [List of speech disorders forms]*⁴ prepared by H. Mierzejewska and D. Emiluta-Rozya [1998, 2008]. The authors proposed the name *speech underdevelopment of cortical origin*, where they develop interpretation of the term by Z. Kordyl. In their interpretation it is “a child’s speech disorder resulting from a damage to cerebral cortex prior to development of properly functioning: phonemic hearing and/or articulatory kinesthetics, and/or other elements of the functional system of speech. The damage prevents correct development of cortical programmes responsible for speech acquisition (language system). As a result there are disruptions in language structures and communication flow (oral and in writing) [Mierzejewska, Emiluta-Rozya, 1998]. The first part of the name indicates at the state of incomplete functioning of language structures, whereas the second part informs about the possible cause of *underdevelopment*, thus about pathomechanism of impairments. That mechanism is impairment of cortex area responsible for correct functioning of language hearing programmes as well as kinesthetic and motor. The authors underline very early occurrence of pathological changes in CNS, in its very particular areas.

Introduction of the abovementioned terms allows for differentiation between *speech disorder of cortical origin* of children whose speech development is

³ Translator’s note

⁴ Translator’s note

abnormal from the beginning, and *aphasic disorders acquired* after the stage of language competence development, i.e. differentiation between *child aphasia* and *aphasia* of adults.

Different names of units describing *cortical impairments* of children are used in speech therapy diagnostic practice in medical and educational centres. A speech therapist employed in medical bodies is obliged to formulate diagnosis based on international classification ICD-10, according to which speech and language developmental impairments are *specific impairments of speech and language* F 80.1 and/or F 80.2 – *specific developmental disorders of speech and language*. On the other hand, in educational facilities speech therapists are bound by legal acts formulated by the Minister of National Education. The impairments described are included in the term *physical disability, including aphasia* and such ruling can be found in the regulation dated 9th August 2017. The name, however, is not fully satisfactory and raise ambiguities. Contents of the term might suggest that *aphasia* – here used in order to denote developmental and acquired impairments – occurs as a result of motor impairment or refers only to motor impairment. Whereas, reports from speech therapy practice indicate at different facts: such children often achieve normal level of motor development and rarely “have selective difficulties in understanding and naming” [Herzyk, 1992]. In the Polish educational system children with various disabilities gain status of children with specific educational needs. On that basis they gain the right to specialist aid in the process of development and education. This group includes children with impairments within the scope of language communication with a diagnosis formulated as *aphasia*.

It should be underlined at this point that in its traditional meaning *aphasia* is the condition of speech after a damage to cerebral cortex which is connected to programmes of language structures. The programmes were already developed prior to the damage and functioned correctly, i.e. people with aphasia in the case of whom anatomical brain damage occurred, used to speak and the language system was fully mastered – in speech and writing [Mierzejewska, Emiluta-Roza, 1998]. Thus it is illogical to use the term *aphasia* with relation to children whose speech development progresses incorrectly from the beginning or never achieved a level appropriate for their age. On the other hand, it is justified to use the term with reference to children who mastered the basics of a language system prior to the occurrence of the factor which damaged brain structures, which as a result lead to inhibiting further speech development or its regress, which is a loss of previously acquired language skills. As a result, it seems that it is possible in the case of children of 3. Whereas, not earlier than at the age of 10 – 12 one may refer to a mature use of speech and language [Porayski-Pomsta, 2015]. Such age specification is a matter of convention and depend on the applied concept of speech development. Some publications underline the possibility to formulate diagnosis

of children *aphasia* not earlier than at the age of 7, considering that age as the time when the process of acquiring basics of language is finished [Panasiuk, 2008]. Clearly, the later a damage occurs in a child's life the more specific and selective the symptoms of speech and language impairment, as they become more similar to the impairments found at adults. It is a result of already developed functional specialisation of cerebral structures [Panasiuk, 2008].

Due to the resolution applied in the educational system, developmental cortical impairments are identified as *developmental aphasia* in the further part of the article.

DIAGNOSTIC TOOLS

Various experimental examination tools can be applied in testing level of linguistic functioning of a child with difficulties in verbal communication. Standardised and normalised trial tests have been among them for a few years. They include:

- *Obrazkowy test słownikowy – Rozumienie OTSR* [*Picture vocabulary test – Comprehension OTSR*]⁵ by E. Haman, K. Fronczyk, and M. Łuniewska. The test checks comprehension of children aged 2;0 to 6;11 [2013].
- *Test rozwoju językowego – TRJ* [*Language development test TRJ*]⁶ by M. Smoczyńska, E. Haman, E. Czaplewska, A. Maryniak, G. Krajewski, N. Banasik, M. Kochańska, M. Łuniewska, which allows testing children at the age of 4;0-8;11 [2015].

OTSR is a test which checks understanding of single words from various grammatical categories: nouns, verbs, adjectives. On the other hand, TRJ enables testing skills: of comprehension – words, sentences, texts, and of expression – production of words, repeating sentences and inflection of words. Therefore, it tests within a specific range: passive and active vocabulary of a child, grammar – mainly noun declension also in plural forms – with a necessity to make alternation within a word.

On the whole, it can be stated that test examinations are of quantitative character and on the basis of the obtained results the level of speech development of a given child can be objectively determined and compared with the results of other children of the same age, sex and similar social background.

When analysing the results of OTSR it should be taken into consideration that the results obtained by a particular child should be related to the norms for monolingual children of typical development. That means the tests have not been standardized and normalized with reference to children from clinical groups. There-

⁵ Translator's note

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fore, the tests can be applied in evaluating children e.g. with impaired hearing, autism, damaged and/or malfunctioning CNS, i.e. various abnormalities in development as a result of which disorders occur within the scope of language communication. Nevertheless, in such a case obtained result cannot be generalized. It can, however, be interpreted individually, limiting the conclusions to the situation of a given child. The level of speech and language understanding is an important prognosis for the development of verbal communication. Disproportions in that scope between the examined child and its peers might be the first signal of surfacing disorders in speech and language development [Jastrzębowska, Pelc-Pękala, 1999; Emiluta-Rozya, 2007].

TRJ not only allows to evaluate the general level of language development, but also provides a chance to determine functional level of the particular examined skills, and on that basis to create a certain profile of the skills – the most and the least developed.

Testing tools allow for objective monitoring of therapeutic progress. They enable building a logopaedic facilitation programme adequate to the level of development of particular skills. However, the pathomechanism of a disorder abnormalities registered during the examination cannot be determined on the basis of examination tests, which prevents specifying a speech diagnosis. In the case when a child obtained a low score in *TRJ*, the authors of the test predict formulation of diagnosis as *SLI – specific language impairment*, i.e. “specific difficulties in acquiring mother tongue with sufficient mastering of other cognitive and motor skills” [2014]. It should also be underlined that test examinations are conducted according to a very specific instruction which formalises the behaviour of a person conducting the test and in a way hinders their natural contact with the child, e.g. lack of presence of third parties – including parents, giving instruction to make a task in a specific manner, i.e. without additional explanation. Clearly, following the rules is extremely important for objectivity and comparability of obtained results. However, in relation to children with significant difficulties in understanding speech and pronunciation the rules may pose a certain threat in applying test examinations. Furthermore, as the child is older, it becomes more aware of its difficulties and very often without a supportive attitude of the examining person it is unwilling or cannot present the complete range of its communicative abilities. The child does not establish emotional and task-oriented contact with the person conducting the examination or withdraws from the examination and refuses to participate in the examination and making further tests.

Such limitations are absent from clinical and experimental logopaedic tests. On the contrary, they assume individualization of the conducted diagnostic activities – adapting them to the level of overall and communicative development of a child. Clinical tests are directed at conducting qualitative analysis of the pre-

sented symptoms and definition of pathomechanism lying behind the abnormalities observed in a given child. In order to achieve the goal it is important to obtain qualitatively and quantitatively representative examination material. Under such circumstances formulation of diagnosis of abnormalities occurring in the examined child's speech and language development becomes more precise and certain.

Among the most often applied clinical and experimental procedures used in examining children with *cortical disorders* are: *Afa-Scala* [*Afa-Scale*⁷] A. Paluch, E. Drewniak-Wołosz, L. Mikosza, *Całościowe badanie logopedyczne* [*Comprehensive logopaedic examination*⁸] prepared by D. Emiluta – Rozya and *Standard postępowania logopedycznego w przypadku alalii i niedokształcenia mowy o typie afazji* [*Standard of logopaedic proceeding in the case of alalia and underdevelopment of speech of aphasic type*⁹] presented by J. Panasiuk [2003; 2002, 2013; 2008]. The tests listed above adopt the formula of the so-called comprehensive tests, i.e. they allow to evaluate comprehension of speech and all signs of active communication, as well as description of condition of the skills – anatomical, functional and social [Emiluta-Rozya, 2013]. The test is of a case study character. One can list the following parts constituting a cohesive procedure:

- initial tests – consisting of an interview, analysis of specialist examinations: medical and psychological, observation of a child's behaviour, attempts to establish emotional and task-oriented contact with a child during play,
- detailed tests – include evaluation of the language system acquisition level. Examination should cover all grammatical and semantic categories characteristic of the Polish language: nouns, verbs, adjectives, adverbs, numerals, prepositions, pronouns. Language structures should be of varied complexity, i.e. story, description, morphological forms: inflection and word formation, sounds of the Polish language.
- examination conducted in order to establish the pathomechanism of speech disorder, that is determination of causes of the existing disorders. There should be made evaluation of structure and efficiency of articulatory apparatus, evaluation of physiological activities within speech organ, evaluation of phonematic hearing, articulatory kinesthetics and memory speech mechanisms [Paluch, Drewniak-Wołosz, Mikosza, 2003; Emiluta-Rozya, 2002, 2013; Panasiuk, 2008].

It is worth mentioning that although the examination activities proposed by the authors differ in terms of their order, scope and level of detail in tests description, there is a major common feature, namely a clear indication at the necessity

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to examine structures of various language organisation level – from elementary to complex or the opposite – from longer utterances to single sounds and to their mutual connection. Such approach is of significant importance in describing *developmental aphasia*, as for its confirmation characteristic language behaviours should be detected in all language subsystems: phonological, lexical, morphological and syntactical. Performing a “comprehensive” examination allows also to formulate a positive diagnosis, a diagnosis in which apart from real communicative abilities of the examined child can be recorded along with language behaviour diverging from normal. As a result, any manifestation of linguistic and extralinguistic communication is detected, even the one developed to a low degree [Grabias, 2001; Paluch, Drewniak-Wołosz, Mikosza, 2003].

In the case of *developmental aphasic disorders* of children, symptoms manifest gradually against abnormal and significantly delayed linguistic competence development. At first, with a 2 – 3 year old child one will not notice a complete spectrum of characteristic behaviour, thus it is not uncommon that only systematically conducted facilitating activities verify the initial diagnostic findings [Emiluta-Rozya, 2002].

CLINICAL SPEECH THERAPY DIAGNOSIS

1. Interview and analysis of specialist tests results

It is very common to expect that the conversation with parents or legal guardians of a child and analysis of specialist test results will clarify the causes of abnormalities observed in a child. There is a strive to reconstruct a story of general development of a child, as well as its communicative behaviour. The most interest is given to earliest stages of a child's life, as then there is the biggest risk of occurring a factor or factors damaging CNS and as a consequence leading to *developmental aphasia*.

During an interview there are questions regarding prenatal, perinatal and early childhood periods. All illnesses experienced by a child are noted down. There is a lot of interest as for communicative behaviour, i.e. looking at a parent, mutual eye contact, returning a smile, observing and imitating other people's behaviour, listening. Much attention is given to information on motor development – acquisition of various motor skills and speech. Data regarding time when babbling occurred and what was its intensity, occurrence of first words and understanding speech by a child. Often there are none apparent burdening facts in a child's life or parents do not remember them. Frequently, parents concerns do not surface until a lack of active speech development is noticed, i.e. a child aged 12-24 months does not say *mommy, daddy* or says only a few words, utterances which do not

resemble any Polish words. Only seldom do remarks occur in parents accounts about poor babbling reactions, lack of complete understanding of simple utterances in the second half of the first year of life.

Noticing abnormalities in motor development of a child is more common. In most cases they are delays in acquiring particular skills such as sitting independently, crawling, walking. Delays, however, do not exceed 6 months. Information about abnormal muscle tone reoccur relatively often: decreased, asymmetric found in early infancy. Often as a result of such diagnosis, motor rehabilitation has been introduced and brought positive results, so that at the age of 2 – 3 years a child does not differ from peers in terms of motor skills. On the other hand, making precise movements, coordination especially in fine motor skills, maintaining balance, orientation in space, as well as the process of developing lateralization still show some existing yet less apparent difficulties.

Most often the so-called non-talking children at the age of 2 – 3 years with suspected *developmental aphasia* do not have conducted diagnostic tests. It is not uncommon that parents make audiology checks in order to eliminate hearing loss. With most children physical hearing is normal. In such cases, if a child does not manifest any other abnormalities in general development and no burdening facts have been found in its life, one should take into consideration occurrence of *delayed speech development*. That is why it is crucial at that stage to stimulate speech development of a small child and observe the dynamics of changes taking place in the level of language application. It should be determined that the less a child speaks, the more difficult it is to make conclusions about conditions of its state. Sustaining abnormality, surfacing of more characteristic behaviour, among others difficulties in understanding, changeability in realizing, may confirm the suspected *developmental aphasia*. Therefore, the older the child and progress in its linguistic ability is insufficient, the more justified it seems to perform complex diagnostics: neurological – examinations: clinical, functional – EEG, neural imaging- MRI or CT and psychological. In some cases conducting specialist tests does not bring unequivocal resolution or answer the question of conditions of recorded abnormalities. Anatomical and functional changes in CNS are not detected. Yet it seems to be connected with a difficulty in finding them rather than their lack [Dąbbska, 1997; Kułakowska, 2003]. Obviously it does happen that there are children with apparent damage or malfunction of CNS which occurred in early childhood, i.e. prior to language and speech acquisition. Such children have complete medical diagnostics and the speech therapy evaluation of their disorders is more certain and clearer.

Confirmation – or exclusion – of cortical mechanism of a disorder is possible via a thorough speech therapy examination which allows to gather and analyse examination material representative in qualitative and quantitative terms.

2. TESTS VERIFYING THE LEVEL OF SPEECH AND LANGUAGE ACQUISITION

Auditory comprehension

The basis for speech understanding is concentration of a child on verbal statement directed to him. One can observe a child's ability to listen in various situations. In the case of children with *aphasic developmental disorders* the ability is developed in insufficient manner. The child often does not react to its own name, invitation to play, a call for halt or stopping inappropriate behaviour. At the same time significant fatigability in reception of auditory information has been observed. They also quickly lose interest in listening, become bored and undertake different activities.

Abnormal comprehension of children with *developmental aphasia* will manifest at various degrees – from minor to significantly decreased. In most cases they adequately react to simple instructions repeated on a daily basis and connected to routine activities. More difficulties occur as the length and grammatical complexity of utterances increase. They will be visible in understanding, e.g. prepositional phrases with prepositions, parent names, abstract names: time, size, space, verbs denoting opposite direction of activity (e.g. *enters-leaves*), pronouns: personal, reflexive, possessive, grammatical forms, structure of subordinate clauses, comparisons, time relations, causal relations. Children have difficulties in understanding correctly the contents of: texts read or heard on its own, mathematical content-based tasks.

Abnormalities in understanding manifest themselves throughout a person's life: in childhood, youth and adulthood, and are more thorough as a child has less cognitive, emotional and social experience [Panasiuk, 2008; Kurowska, 2015].

Utterances of various level of complexity

Initially a child communicates mostly nonverbally and compensates with gestures its inability to realise an utterance: indicating, illustrative at times, facial expression, leading an adult to a given spot, sometimes vocalising or making random syllable sequences. Only after a certain period of facilitation a child begins to answer questions by means of particles: *yes, no* and begins participating in a dialogue. Gradually, a skill of building simple, two syllable words develops. The structure of words undergoes deformations. Reduction of word parts, syllables, consonant clusters is recorded. Difficulties in naming and actualization is manifested. The most significant abnormalities are observed in applying correct grammatical forms: plural forms of nouns, declension, conjugation, and in making

alternations inside words – in terms of quantity and quality. Progress in that scope is very slow. The enormous difficulty in correct adoption of lexical and grammatical items to the changing linguistic context most vividly manifests in narrative utterances. The child builds longer texts in a chaotic, incoherent and uncommunicative manner. Such abnormalities can be observed throughout the whole life of a person with *developmental aphasia* [Panasiuk, 2008; Kurowska, 2015]. Often a child without additional, detailed questions is unable to build a longer narrative utterance. Answers to the asked questions are also usually very precise, short and formulated from single clauses and equivalent sentences. While building a description or story children use very limited and not diverse vocabulary. Phonetic and phonological structure of words is often distorted. Sometimes the utterances are unintelligible. Children specify only the elements shown in pictures or produce combinations. They do not recreate chronological sequence of events, cause and effect relations.

Realisation of speech sounds

At the level of realisation of speech sounds a characteristic feature of *developmental aphasia* is the large variety of reactions – lack of stability, i.e. changeable different realisations of the same tested sound, there are wrong realisations of a sound next to the correct ones [Mierzejewska, 1971, 1977; Strachalska, 2013]. The most common are substitutions (paraphasia), mainly developmental. They are realisations of apical dental sounds as prepalatal: [s → ɛ], [z → ʒ], [ʃ̣ → ʃ̣̣], [ʤ̣ → ʤ̣̣], realisations of apical alveolar sounds as apical dental sounds: [ʃ̣ → s] [ʒ → ʒ̣] [ʧ̣ → ʧ̣̣] [ʤ̣ → ʤ̣̣] and [l] as [j], [k, g] as [t, d], [r] as [j, l]. At times realisations consolidate in such forms for the whole life of a person with *developmental aphasia* and in such cases they should be considered as abnormal realisations. There are also malformations which most often are so-called temporary or intermediary sounds, of an incomplete articulatory and sound realisation [Emiluta-Rozya, 2013, 46]. Such reactions are manifestations of still inadequately developed and fixed articulatory and sound patterns e.g. [b → b(p)], [g → g(k)¹⁰], [ɛ → ʃ̣^{e11}], [x → ɛ^{x12}], [ʃ̣ → ɛ̣^s], [ʧ̣ → ɛ̣^t], [ʒ → ʒ lat.¹³], [ʧ̣ → ʧ̣ lat.], [r → l/r¹⁴] [Kurowska, 2016].

¹⁰ Sounds of incomplete voicing [b(p)], [g(k)] incomplete realisation of the sonority [b], [g]

¹¹ A symbol or a group of symbols written above a normal text means that sounds or a group of sounds are pronounced in a weaker manner

¹² Sounds with a transitional realisation of the speech organs approximation level, a shift of place of realization

¹³ Sounds with shifted place of realization (e.g. lateral)

¹⁴ Incomplete realisation of vibrations

3. PATHOMECHANISM OF DISORDERS

Examination of structure and function of articulatory apparatus

Structure of speech organs is normal in the case of children with *developmental aphasia*. General motor skills of: lips, tongue, soft palate, are also normal for a child's age. Abnormalities in the scope of tongue elevation are often observed, as well as lowered precision, rate of realisation and memorizing sets of movements. Children make mistakes in the order of performed movements, in exercises consisting of a few simple elements connected in a given order. There is also a clear difficulty in making intentional movements.

FUNCTIONING OF PHONEMATIC HEARING, ARTICULATORY KINESTHETICS AND VERBAL MEMORY

The character of disturbances of sounds recorded in conducted tests – in reception and realisation -as well as their number allow for more precise diagnosis of *cortical disorders*. In the case of the tests it is crucial to conduct them appropriately for the sake of interpretation of results. It is necessary for a child to correctly understand the rules of performed tasks [Kurowska, 2013]. Tests are relatively long and monotonous thus considerable fatigability of a child and its poor concentration should be taken into account. At the same time, in order to obtain reliable results one should accumulate significant – in terms of number – material subject to analysis. That is why tests should be divided into stages, enabling execution of the task over a few or more appointments. The most interesting way to test phonematic hearing is the paronymic test due to application of picture material. Commonly in the case of children with *developmental aphasia* abnormalities in phonematic hearing and articulatory kinesthetics coexist [Kurowska, 2016]. Vocabulary memory is lowered.

Tłumaczenie: Elżbieta Wlazło

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