

KAZIMIERA KRAKOWIAK

John Paul II Catholic University of Lublin
Chair of Special Pedagogy

ORCID ID: <https://orcid.org/0000-0002-3995-2303>

Language in the light of research on communication of children with hearing impairments

Who has language 'has' the world.
/Hans-Georg Gadamer, 2013, p. 609/

*The most palpable description of bread
is the description of hunger*
/Tadeusz Różewicz, 1968/

SUMMARY

The aim of the following article is to present synthetically the phenomena identified in the course of multiannual observations of communication acts of children, adolescents (babies, kindergarten-age children, pupils and students), as well as adults with hearing impairments in their everyday life, family, kindergarten, school and local environments. The task the author set herself is an attempt to distinguish the main elements, factors and properties of the process of language acquisition by persons who experience different hearing impairments, moreover, to indicate those which are universal and allow, at the same time, to see the language itself in its main humanistic role. This issue merits attention not only due to its importance in terms of surdologopedics and special pedagogy mission, but also because of the most significant problems of contemporary humanities and social sciences, which seek to explain the essence of multiple and complex phenomena that are a consequence of language and mind connection disturbances between persons and cultures.

Key words: language, phonic language, sign language, idiolect, children with hearing impairments, hard of hearing, language education, methods of language education, method of phonogestures (Polish Cued Speech).

Questions about what language is, and especially how it appears in child's mind are still the questions about the secrets of human mind – a being mysterious to it very self, rooted in the biological substance of the brain. It is the being

that detaches itself from this substance by the streams of cognitive activity and consciousness. Linguistic activities are present in the sources of these streams and clarifying their nature, seems to be a very important contribution to cognising the essence of humanity. With humble approach to the mysteries of human existence as an integral – biopsychosocial and spiritual – personal being, which are the subject matter of many scientific disciplines (especially anthropology, philosophy of language, developmental psychology and neurobiology), it is possible and even worth to focus one's scientific attention on these elements of language acquisition processes that are visible in communication of the children who experience the difficulties caused by the constraints of auditory access to speech sounds. Such an experience, in an evident way, reveals very important properties of structure and driving forces of language exchange of meaning process, which allows people for interpersonal mind connectivity.

For most of us language communication is as natural and easy as breathing, which is why the common knowledge does not gather the reflections explaining this phenomenon. We speak automatically without analysing individual components and without realizing the course of our action. We concentrate on the aims and content of the message, i.e. on the social language activity, which remains in the sphere of our consciousness and will. Hence, we treat language as a simple tool that serves to influence other people. However, we do not pay attention to the complex character of speaking and communication, and especially to the role of language in formulating our knowledge about the reality and its participation in our human and personal identity.

Also in philosophical and linguistic reflection, language is treated as an entity accessible to a human in an obvious way, even as an “all-encompassing human existence Being” (H. G. Gadamer 2000). Only communication and speech disturbances place us before the complexity and mysteries of the phenomenon of human language activities (K. Krakowiak 2012, pp. 26–27 et al.).

The aim of the following considerations is to describe synthetically the phenomena identified in the course of multiannual observations of communication of children, adolescents (infants, kindergarten-age children, pupils and students), as well as adults with hearing impairments in their everyday life, family, kindergarten, school and local environments. The task set by the author is an attempt to distinguish the main elements, factors and properties of the process of language acquisition by persons who experience various hearing impairments, moreover, to indicate those features which are universal and allow, at the same time, to see the language itself in its main, humanistic role. This issue merits attention not only due to its importance in terms of surdologopedic therapy and special pedagogy tasks, but also because of the most prominent problems of contemporary humanities and social sciences, which seek to explain the essence of multiple and com-

plex phenomena that are a consequence of language and intellectual connection disturbances between persons and cultures.

In the application aspect, giving this issue consideration may lead to clarifying the core of misunderstandings and conflicts between the specialists undertaking activities for the education of people with hearing impairments who cannot hold the rational discourse due to the lack of common language to describe occurring phenomena. The search for a universal language that would serve to determine the objectives, principles, and methods of educating children/pupils with this type of disability, becomes especially important in the face of social changes related to the idea and programs of inclusive education implemented in Poland and other European countries.

The idea of inclusion can be understood in different ways. Its most important element is striving to eliminate barriers to the development of all of the pupils and each of them individually at the same time. Since human development takes place in a social community, the objective is to create the communities that communicate in an optimal way: effective and harmonious, the way that enables proper relations between all community members, not excluding, and especially not rejecting anyone.

COMMON AND SPECIALISTIC KNOWLEDGE ABOUT LANGUAGE AND COMMUNICATION OF PERSONS WITH HEARING LOSS.

Common knowledge of problems of persons with hearing impairments is comprised of views arising from observations of individual facts, and are subject to the process of simplified generalizations and stereotyping. False convictions can also be found in many arguments considered to be scientific, whose authors created their own theories and models in isolation from the experience of real-life interpersonal relations, based on the second-hand information, as well as, the uncritically repeated quotations and testimonies of authorities acknowledged in other fields of knowledge. The conviction which is attributed to Aristoteles, can be considered as the first of such opinions. Without noticing the cognitive-linguistic activity of the deaf-mute, he refused to recognise their belonging to human beings and claimed that they are no different from animals, as they do not possess the most important human property – the logos, word.¹

The lifetime of this belief was very long. At the end of the twentieth century, in some scientific communities, there could be still encountered the view that the research on deaf people's language is pointless, as there is no such thing. Signs in

¹ In fact, Plato already indicated the lack of language in deaf-mute people and did not accept their presence in an ideal state (see T. Adamiec 2003, pp. 237–263).

these scientific environments were considered a mean of non-verbal expression, or a language surrogate, or some other form of words or letters substance, according to original assumption of Abbé Charles Michel de l'Épée (1712–1789; see K. Krakowiak 2012, pp. 190–194).

To this day, some researchers and theorists express their doubts whether a person who does not hear speech sounds since birth and does not acquire the phonic language in a natural way, can perform language activities. They believe that speech sounds are the only 'language material' and that the only way the brain can undertake language activities is through auditory impression. In that way, they assume that the lack of access to acoustic form of string of speech causes the blockage in child's language acquisition.

Indeed, in some particular life conditions and situations of educational neglect, deafness may result in muteness, i.e. the absence of articulated speech. However, the lack of ability to hear sounds and the lack of articulation competence are not the same as complete absence of language in mind and deprivation of the ability to communicate with other people, and above all it does not mean the absence of mental activity which relies on using – in internal monologue – not only the individual signs, but also the constructs made of various signs according to the rules that one adopted. In that way, the rules for determining meanings and the rules of thinking organize the sphere where occurs the interpersonal mind connection and takes place the process of linguistic exchange of mental content. A person with hearing loss – lonely and isolated from other people – defines these rules alone.

An example of a false view is also the opposite thesis – for some people apparently obvious – that without hearing the sounds of speech one can – with no difficulty – learn to read and while reading learn the 'written language'. This illusion was already described and explained in the 1960s by R. Orin Cornett (R.O. Cornett, M.e. Daisey 2009). However, this did not affect significantly neither the common convictions, nor the beliefs of researchers who did not know his works and who had, at the same time, limited contact with people of different types and degrees of hearing loss. This conviction finds an apparent justification in common observations which indicate that you can find – quite numerous – individuals who read capably even though they cannot hear perfectly, and sometimes they hear very poorly or they do not hear speech sounds at all. If we do not ask a question about their previous state of hearing and the way they acquired the basis of language in their early childhood, it is very easy to draw and generalize the wrong conclusions. The results of research and scientific considerations are divergent and require in-depth analysis (M. Białas 2007; M. Korendo 2009; E. Domagała-Zyśk 2017a; 2017b).

The loss of hearing ability after – even partial- language acquisition creates completely different situation than the lack of auditory sensitivity which has

already occurred in the prenatal life or immediately after the birth. The observation and generalization of reflections are complicated by the fact that many children with hereditary hearing impairments (having deaf parents) are born with full or partial auditory sensitivity, but they lose it – gradually – only in subsequent years of life. During infancy and early childhood, they acquire the fundamentals of phonic language by listening to speech in a wider social environment and gain the knowledge about sounds of speech (phones and syllables). They use this knowledge later on when they learn to read.

However, most of people with hearing impairments experience severe and complex difficulties in reading comprehension. The main cause of such difficulties should not be sought in the limitation of hearing sensitivity itself and alleged deficiencies in reading technique. At the basis of reading skills with full comprehension of the text content lays the language competence developed in the course of direct communication in specific life situations, which allows to ascribe to words and utterances, the meanings relevant to the conventions adopted by a given language. In other words, to read with full understanding of content and to develop, in this way, the primary language, it is important, first of all, to get to know this language on its elementary level in the course of direct communication in social environment.

Traditionally educated pupils and the graduates of special schools use various reading techniques, which are developed individually. It is often an incomplete reading consisting in recognizing certain words and collocations and ascribing them meanings only partially adequate to the language norm: extended, narrowed or corresponding to the meaning of sign language characters, which is not identical to the meaning of words. Reaching the meaning and significance of a text requires an enormous effort, is inefficient and frustrating. Zofia Sękowska described this way of using language as syncretism (Z. Sękowska 1965). Incomplete – and often meaning falsifying – reading exposes deaf persons to the reduction of evaluation of their intellectual capabilities and to social degradation (see K. Krakowiak 2004). On the other hand, the ability to read and the readership are the main path to rehabilitation and education of persons with hearing impairments. The questions about methods of teaching reading constitute an important area of language education problems for this group of people with special educational needs. Undertaking the research into this issue should be welcomed with hope and approval (A. Dłużniewska 2016).

The source of many difficult questions and misunderstanding is also the hermetic and complex phenomenon of communicating with the use of signs which can have multiple organization and an infinite number of individual forms. Each person with hearing loss – who uses sign language – uses the signs in their own way, which results from their individual needs and possibilities related to the method of acquisition and the type of primary language, the level of knowledge of

phonic language, and the experience in communicating with the environment in which there live both the people who speak and/or people who use sign language. There are numerous and varied sign codes and ways of using them in communication around the world and in Poland. This phenomenon deserves understanding, explanation and approval.

Ambiguities and simplifications in this area appear in the context of socio-political activities in defence of the community of “d/Deaf” (see, for example M. Świdziński, ed., 2014). Mixing scientific terms with ideological persuasion – even if soaked with positive emotions and motivated by the noble ambition to improve, unify and promote sign language – hinders the rational exchange of thoughts and obscures the image of reality.

Numerous excessive generalizations of only partially true theses arise also in therapists’ communities promoting rehabilitation programs focused on preconceptions and standards of conduct. However, such programmes – verified and effective in certain conditions, when selecting a group of patients corresponding to the program – they do not have the value of the universal solution to theoretical problems, and in practice they do not cover with their beneficial effectiveness all groups of people with hearing impairment. Generalizations based on experience narrowed to a specific field of observation lead to conclusions which are legitimate for the studied area of reality, but still insufficient if one would like to accept them as fundamental theses in research from another area of experience, and especially in research aimed at developing a full theoretical model of phenomena. Valuable and inspirational works of eminent Polish speech therapists contain descriptions of selected phenomena, but omit huge areas of reality not covered by the authors’ attention (see for example Z. M. Kurkowski 1996; J. Cieszyńska 2000; Z. Orłowska-Popek 2017).

Contemporary research on the language and language communication of people with hearing impairments – based on various anthropological and ideological assumptions – is conducted with the use of various sets of conceptual apparatus, and above all with a focus on different application purposes. In this situation, it is difficult to undertake a structured and consistent scientific discourse with due respect for the theses of interlocutors. It is even difficult to make a coherent review of these theses, as they are usually immersed in streams of multi-subject reflection belonging to various scientific fields and disciplines (an attempt to summarize the current knowledge from the perspective of special pedagogy and speech therapy is contained in: K. Krakowiak 2012, pp. 213–328). Nevertheless, it is worth to constantly keep undertaking the effort to organize the experience and reflection again and again, with the hope of practical usefulness of critical thinking.

METHODOLOGICAL ASSUMPTIONS OF AUTHOR'S OWN RESEARCH PROCEDURE

When characterising one's own research procedure it is necessary to consider first of all the sources of knowledge, the way they are obtained and organised, and then the course of analysis and interpretation of observation and research results. The following article summarizes the research and observations carried out in many living environments of people with hearing impairments in the period from 1985 to 2018. Over the past thirty-three years, the author has conducted two long-term educational experiments. The first of them involved the use of the phonogestures method (speech visualization with the use of phonogestures; author's adaptation of Cued Speech; K. Krakowiak 1995). The second one was to organise an academic environment inclusive for students with hearing impairments (K. Krakowiak 2003; 2004b; K. Krakowiak et al. ed., 2011b). The detailed results of these studies have been published in several monographs and many articles (K. Krakowiak 2006). Both experiments were repeated and verified by other people (J. Leszka 2006, M. Białas 2007). The observations and action research have been conducted and still are by the doctoral students and research associates within the Department of Special Pedagogy at the John Paul II Catholic University of Lublin and the Centre of Education of Deaf and Hard of Hearing acting by the Department (K. Krakowiak 2012, pp. 261–282).

For the subject and methodology of the research being carried out, the radical changes in the care of children affected by hearing loss, which have occurred during this period, are important. First of all, we are witnessing some dynamic changes in the area of medical care: the improvement of early detection of hearing loss in newborns, an in-depth audiological diagnosis, and prosthetic supply, which opens the new perspectives for therapeutic and rehabilitative treatment (K. Krakowiak 2016a). Intensive changes also apply to early speech therapy care, as well as, programs and methods of education (K. Krakowiak 2016b).

In the detailed descriptions, analyses and interpretations of research results there is used a polymethodical approach, which applies many registration and measurement tools, language tests, free and categorized observation, and above all observation in the course of communication, therapeutic and didactic activities. The collected data are diverse. They include numerous detailed results of speech therapy diagnosis and biopsychosocial functional diagnosis, the analysis of communication behaviour and strategies for dealing with communication difficulties as well as individual styles and communication systems, and also observations of communities and socio-environmental conditions of language communication.

The following article contains only the most general conclusions resulting from conducted research and analyses as well as the enumeration of phenomena

that represent the language activities of people with hearing impairments, especially their development in children, and at the same time reveal the specifically human, universal nature of these phenomena.

THE AREAS OF RESEARCH PROBLEMS AND CAUSES OF DIFFICULTIES IN LEARNING ABOUT THE INDIVIDUAL EXPERIENCE OF PEOPLE WITH HEARING LOSS

As the most valuable source of knowledge about language communication of persons with hearing impairments should be considered their own knowledge. The problem is how to get this knowledge. The difficulties in linguistic communication mean that the deaf and hard of hearing persons are often unable to present their own experiences and reflections on personal problems in this area. The participant observation does not lead to rapid and reliable generalisations, as the individual experiences are varied and unavailable. What is more, there are often contaminated by the distortions caused by deficiencies in audiological and speech therapy diagnosis, disordered emotions, frustrations, the desire to hide “flaws and imperfections”, and actions influenced by ideologies and stereotypes. The observer must carefully recognize the various factors and their coincidences.

A synthetic approach to knowledge resulting from the experience of language communication of people with reduced auditory sensitivity requires consideration of phenomena belonging to the areas of research of many scientific disciplines. Such issues can be found in the area of cognitive problems of neurolinguistics and developmental psycholinguistics, sociolinguistics and social pedagogy, speech therapy and special pedagogy, as well as general linguistics, semiotics and language philosophy. Interdisciplinary approach to the problems encounters obstacles related to the terminology and methodology of individual sciences. Hence, in addition to the restraint required from reliable researcher, there is required the simplicity of the language of description, which would help to reveal the complexity of phenomena in a commonly understandable way.

When undertaking research on these issues, one should be aware of their humanistic significance, because they relate to the essence of human language activities and the language itself as a semiotic being. These issues cover a vast area of reality, starting from acoustic phenomena, sound properties and the processes of their production and processing (e.g. electronic), through the functioning of the senses and language functions of the brain, and the possibility of their modification (e.g. enrichment by additional sensory-motor activation using phonogestures ; K. Krakowiak 1995, K. Krakowiak, B. Ostapiuk 2018).

Central area constitutes the content of knowledge about the world, which is reflected and created with the use of language by people and the significance and

meaning of messages, which are communicated in direct interactions and in written texts which preserve the messages. All of the language functions are located in this area. It is here where the most serious difficulties occur: in gaining the access – both to semantics and to grammar – and in language impairments in people who experience difficulties in accessing speech sounds. In this area, theorists and researchers representing various scientific disciplines – using different terms – are looking for the boundaries between language and thinking and the mutual relations between language and cognitive activities.

The nodal cognitive problem constitutes the essence of the perception of morphological stream of speech and the properties of neural base of brain activities which allow for deciphering vast content of reality cognition with the use of dozens of phonemes that are organized in the sequences composed of barely few hundred eurythmically pronounced syllables (Krakowiak K., 2004a). This amazing property of language structure – referred to by linguists as a duality of patterning or double articulation – is the permanent core of the mechanism that enables people to interact by communication. Moreover, there is based on it system of coding the meaningful units and systemizing their relations and interdependencies in the form of a semantical-grammatical system, which normalizes interpersonal reconciliations and transmissions of meanings. In a universal experience, linguistic activities involve operating all the elements of the linguistic system in a manner that is consistent with its principles. The situation of persons with hearing loss reveals the importance of the harmonious course of these activities and the effects of their occurring impediments. Overcoming the obstacles requires the usage of these specific abilities – cognitive, creative, and communicative – which characterize human as a rational being that communicates with other social community members with the use of language.

At the same time, there should be taken into account the basic condition for language communication as defined by Stanisław Grabias: ‘for a man to take part in language communication without hindrance, it is important to have at their disposal some kind of competences and a certain type of abilities. It should be emphasized that these competences and skills are two sides of the same phenomenon. They condition each other in a way that the competencies which are knowledge, cannot appear in the human mind without specific abilities, and the abilities that are a skill, do not reveal themselves without previously acquired competence’ (S. Grabias 2008, p. 26). Stanisław Grabias distinguishes three types of competences (language, communication, and cultural) and two types of skills (perceptual and performance). Understanding the mechanism of mutual conditioning of the development of these competences and skills requires explaining the human being’s ability to code meanings in precisely ordered strings of syllables.

THE MOST IMPORTANT RESULTS OF RESEARCH AND OBSERVATIONS ON READINESS TO ACQUIRE LANGUAGE OF CHILDREN WITH HEARING LOSS

The results of conducted research that took form of many years of case studies and observations of experimental groups, as well as other children groups can be summarized in the form of the following general theses, which constitute the basis for detailed research:

1. Children with hearing loss display the readiness for language acquisition; this is evident in the following characteristics of their behaviour:
 - a. they look for a contact with other people (they observe the faces of their mothers and faces of other people around them, they look into the eyes, react to facial expressions and gestures of people surrounding them),
 - b. they initiate communication interactions and observe the reactions of others;
 - c. they respond to the behaviour of other people by mirroring it, imitating it and expressing reaction (smile, fear, imitation of facial expression and gestures);
 - d. they are capable of responding to sounds and recognizing the human voice, if they have even minimal auditory sensitivity, especially after implementing well-chosen prothesis;
 - e. they are able to make sounds and they undertake attempts to articulate; they not only coo but also make an attempt to babble within the range of sounds that they can receive (e.g. low vocalizations and the sounds causing strong bone resonance; L. Kaczmarek 1977, p.275);
 - f. they categorise and integrate sensory impressions, searching for their similarities and constancy in the streams of received signals (e.g. lip movements, phonogestural speech, gestures, iconic and graphic signs, letters);
 - g. they attribute meanings to other people and their own behaviour; they remember and repeat them,
 - h. they assign the meanings to iconic and graphic characters,
 - i. they recognize writing.
2. Children with hearing loss display the readiness to cognitive development with the use of language:
 - a. they categorize the components of the situation and demonstrate the efficiency of combining observations into logical relations,
 - b. they search for the cause and effect relationships and check the relevance of their own inference in action,

- c. they act purposively and anticipate the effects of their actions,
 - d. they explore the environment and carry out “children’s experiments” with items within their reach,
 - e. they compare observations and exhibit the ability to notice analogies,
 - f. they independently create abstract concepts (which are original, often not found in the language used in the educational environment).
3. Children with hearing impairments display readiness to interpersonal exchange of meanings and participation in the community in which they are raised:
- a. they display the ability to intuit the mental activities of other people and attempt to influence them,
 - b. they display the susceptibility to learning the accepted (conventional) behaviours in the field of eating, physiological activities, getting dressed, washing etc.,
 - c. they demonstrate the ability to assign many different meanings to signs (and words) and to understand and create the figurative meanings (similes, metaphors, phrasemes),
 - d. they independently create metaphors (which are original and do not occur in the language used in their educational environment).
4. Children with hearing impairments demonstrate their capacity to create independently signs and expressions of their own language by using facial expressions, gestures and graphic symbols:
- a. they attribute meanings to gesture and mimic signals (they assign meaning to signs),
 - b. they name persons, objects and activities with signs from sign language,
 - c. they undertake attempts to communicate with others by using signs,
 - d. they search in their surroundings people who understand signs from sign language and initiate contacts with them,
 - e. they draw illustrations, diagrams and graphic symbols.

The presented theses can be concluded with one statement: hearing loss does not affect child’s cognitive and linguistic development potential (see K. Krakowiak 2011a), however – by blocking the access to speech sounds – it causes the risk of disconnection from the socio-cultural environment, which is a natural environment necessary for human development. The easiest postulate resulting from this thesis seems to be an order to strive to remove the hearing impairment itself in all children. It turns out, however that – with the great achievements of medical science and the art of prosthesis - this is not always possible.

Development potential and readiness to acquire a language is only a preview of the opportunity on which parents, speech therapists and pedagogues can base their hope on the effectiveness of actions that we call language education and

speech therapy. The essence of these activities is to support a child in joining the socio-cultural environment. The first condition for the effectiveness of such activities is the accurate diagnosis of child's special developmental needs. These needs are individual and result from the size of barriers to access the language and to the reality reflected by the language, posed by specific hearing impairment in a specific social environment. The special role in this environment play the people who stay in close everyday relations with the child. Their ability to adapt to the child's special needs and to provide them with language determines their development.

THE MAIN PROBLEMS OF DETAILED RESEARCH ON LANGUAGE ACQUISITION IN CHILDREN WITH HEARING IMPAIRMENTS

The main issue of the presented research constitutes the following question: what conditions must be fulfilled so that a child with hearing impairment can acquire a language in a natural way? This question raises many derivative and partial problems. The first is the question about the specificity of language acquisition by a child with impaired hearing and what barriers must be overcome for this process to occur. Barriers to development and deficiencies in the child's language experience, which arise as a consequence of their occurrence, with particular clarity reveal the elements and course of the process of language acquisition by a child.

Numerous and complicated problems arising from the main question are faced by an observer of speech development in children with hearing loss in a form of a mystery of individual variety of the course of this process in individual people. The research on speech development in child, both the older one, conducted by linguists, psychologists, and speech therapists, as well as the latest, which remain in the domain of developmental psycholinguistics, clearly validate the thesis that in this process there are present common phenomena, which can be said to occur in the development of all children of the world. There are also the individual phenomena, which are conditioned by biopsychosocial factors that appear only in certain groups of children, and even - quite sporadically and exceptionally - in specific individuals. Careful observation of children with hearing impairments seems to indicate that this is a group comprised of 'exceptions'.

Hence, there arises a question whether it is possible to identify the differences between special development needs of individual persons and to divide them in such a way that would enable the establishment of a standard diagnostic and therapeutic procedures. Of course, there have been existing the typologies for a long time, as well as the attempts to precisely classify the hearing loss itself and the groups of people affected by this impairment. The author of the first of them was the sixteenth-century Italian physician and humanist, Girolamo Cardano

(1501–1576). He recognized not only various degrees of hearing loss, but also their types related to its location, i.e. conductive and sensorineural. The audiologists have developed numerous methods, tools and techniques for testing functions of hearing organ (see e.g. K. Iwanicka-Pronicka, M. Radziszewska-Konopko, H. Siedlecka 2007). None of these methods, however, makes it possible to explain the essence of the diversity of the population of people with hearing impairments in terms of their potential ability to acquire phonic language and the resources of their capacity to create sign language. Both speaking skills and richness of internal monologue, as well as language competence, are not directly dependent on the degree of hearing loss. Due to the complex configurations of biological, psychological and social factors, we cannot anticipate the consequences of their interactions.

Therefore, the research preceding the main research should aim at identifying the most important factors that create language acquisition barriers and developing the strategies for removing these barriers. Taking this objective into consideration, the following problem questions should be asked:

1. What kind of barriers block children with hearing impairments access to the morphological speech string, assigning meanings to words, and assimilating the principles of combining them in syntactic relations?
2. What type of barriers block the effectiveness of auditory prosthesis and education, which aims to improve hearing and provide access to acoustic speech string?
3. What barriers block the development of hearing people's ability to communicate with children with hearing loss in family, educational and local environments?
4. What kind of obstacles blocks the use of methods supporting communication and language acquisition based on the visualization of speaking and sharing the morphological speech strings (e.g. cued speech method)?

While supplementing and continuing asking questions about the barriers to language and speech acquisition in children with hearing impairments, it is important to inquire about the conditions and factors determining the possibilities of overcoming these obstacles;

1. What conditions must be fulfilled to make the acquisition of phonic language and speech development in a child with hearing loss happen naturally without the need for speech therapy to support this process?
2. What factors determine the need to use methods that support the process of phonic language and speech acquisition in a child with hearing impairment?
3. What factors determine the need for implementing alternative means of communication with a child with hearing impairment?

4. What data from biopsychosocial diagnosis should be taken into account when choosing methods and measures to support speech in communicating with a child with hearing impairment (e.g. early teaching of reading or phonogestures)?
5. What data from biopsychosocial diagnosis should be taken into account when deciding on an alternative - i.e. speech-replacing - method of communication with children with hearing impairments, namely the sign language.
6. What factors decide about the fact that people with hearing impairments, living in groups, create signs collections and sign languages?

All these questions must be confronted with the main feature of the research group, namely its multiple diversity. It is not possible to generalize the conclusions resulting from the observation of language acquisition of the entire population without clearly recognizing the differences in terms of individual potential and needs.

THE RESULTS OF RESEARCH ON BARRIERS TO LANGUAGE AND SPEECH ACQUISITION AND DIVERSITY OF THE POPULATION OF PEOPLE WITH HEARING LOSS IN TERMS OF HEARING THE SPEECH SOUNDS

Differences regarding individual capabilities and special educational needs of children with hearing impairments should be observed and described from the perspective of the entire language acquisition process, and especially from the perspective of a functional hearing evaluation. From this standpoint, there can be distinguished- in the simplest way – four groups of children with hearing impairments (K. Krakowiak 2006), and simultaneously, four measures of barriers to access to phonic language. The division criterion is not audiometrically determined size of the loss of hearing sensitivity but the ability, obtained in the course of language experience, to distinguish and recognize linguistic units of speech strings, i.e. the phones in syllables. This capability is referred to as phonemic (phonematic) hearing. It develops in a child as a result of synergistic sensory activities and the integration of observations. Evaluation of this ability allows to include individual persons in one of the following groups:

Group I

Functionally hearing children, who admittedly hear imperfectly in difficult and natural acoustic conditions (especially soft sounds, sounds coming from a distance, noise ...), but in special acoustic conditions (with prosthesis, in silence, from close range) they receive, isolate and accurately identify all classes of speech

sounds, i.e. the classes of phones (phonemes), as well as the prosodic features of the speech streams (accent and intonation). These children acquire language naturally, just like the children with 'normal' hearing (sometimes with a slight delay), and their speech develops without serious disturbances.

The consequence of hearing loss is a subjective feeling of discomfort associated with the use of prostheses (e.g. one-way hearing, hypersensitivity to certain sounds, including music) or in situations where there is a disruption in the functioning of the prostheses. The special developmental needs of this group of children are met by professional audiological care, parents' care for the efficiency of prostheses and understanding of the difficulties in communicating with them through the social surrounding, especially in the school environment.

Group II

Hard-of-hearing children, who hear imperfectly not only in natural acoustic conditions (especially quiet sounds, coming from afar, in noise ...) but also in special conditions (with prosthesis, in silence, from close range ...), but they know what sounds of speech can be heard, they distinguish the same classes of units that are distinguished by well-hearing people, although they do not always accurately identify them by confusing sounds and misunderstanding words. They generally recognize correctly the prosodic features of a speech stream. Their limitation of hearing sounds and syllables is referred to as mild dysphonemia.

This degree of limitation in the efficiency of hearing speech sounds contributes to the delay in language acquisition, especially in cases of educational neglect. It may also be related to the occurrence of speech impediments of the nature of audiogenic dyslalia (child speaks the way they hear). Their language is poorer than the language of their peers, and the knowledge about the world develops with difficulties resulting from deficiencies in the knowledge of the lexical system (deficiencies in the knowledge of expressions and/or incorrect understanding of them) and from the limitations of communication experience (limitations in language interactions in social environment).

The special developmental and educational needs of this group of children are multiple. The child needs not only professional audiological care, parental concern about the efficiency of prostheses and speech development. It is also necessary to provide them with constant speech therapy and the adaptation of people from the educational environment surrounding the child to their special needs in communication. Social support is also important, in many cases, along with mental and psychological support.

Group III

Severely hard-of-hearing children with severe hearing impairments who hear differently than people who hear correctly, they distinguish different classes

of sound units and recognize only part of speech sounds. They identify or confuse many phones with others. The number of phones identified or confused with others varies from person to person. This condition is referred to as dysphonemia of moderate, severe, or profound degree. A moderate, severe and profound degree can be determined based on the number of confused and identified phones.

Such limitation in the efficiency of hearing the speech sounds, especially in a situation where it is not possible to improve it quickly by using prosthetic correction and auditory education, is the reason for blocking speech development and natural language acquisition. In that way, language acquisition (acquiring and learning) requires special supportive measures, such as language education and speech therapy. Child's special developmental and educational needs arise from the wish to gain full access to the language. The way a child is provided with this access by the family and the educational environment determines child's chances for development. The actions commonly applied to children from this group do not differ from steps applicable to children with mild dysphonemia. Although, they are necessary, they are insufficient. It is essential to apply the methods that support the multisensory perception of speech stream and develop the ability to distinguish phones and syllables.

Group IV

Functionally deaf children, who cannot hear the sounds of articulated speech, do not distinguish between classes of sound units despite the use of hearing aids and/or cochlear implants. This does not mean that they completely cannot hear the sounds from the environment or the human voice. They can hear some sounds – especially the ones which are very loud or intensified and processed by prostheses – but in the stream of speech sounds, they do not discriminate or identify its components and cannot assign them the linguistic value in order to encode their meanings. This state of hearing capability is called an aphonemia. Special developmental and educational needs of children from this group should be diagnosed individually. Their hearing, despite the inability to hear the sounds of speech, should be constantly improved. It is not to be excluded that in some individual cases, the efficiency of hearing phones will develop with time, as a result of auditory and linguistic education. However, language acquisition requires a special rehabilitation program.

Functionally deaf children, just like the severely hard-of-hearing ones, make strenuous attempts to recognize the sense of the behaviour of people surrounding them. They also assign meaning to sounds in the form in which they perceive them. They create signals, which are also often in the form of sound (of an onomatopoeia, calls or exclamations nature). However, the form of these signals is peculiar and unlike to the words used by the social environment. Therefore, the

hearing social environment does not respond to them in accordance with child's intentions. In the absence of reaction, the child usually gives up this type of activity and attempts to give meanings to mimic and gestural signals (they create signs). If there are conditions for communicating with a wider environment that involves signing, especially when in the family there are people who can sign, the child learns to communicate by using the same signs or the variety of sign language that is used by their surroundings. This is undoubtedly beneficial for a child's access to their loved ones and enables his or her mental development in the family environment. However, limiting communication to signs or to sign language, and then attempting to teach such child reading without developing communicative speech, usually leads to blocking the access to wider social communities.

Thanks to their preserved abilities, all children with hearing impairments can explore the phonic language and learn communicative speech through the procedures of special speech therapy. Its program, methods and means of supporting verbal communication should be adapted to individual needs of each child. From a speech therapy point of view, the variety of special needs in this area makes it necessary to develop various programs of linguistic education and sets out various therapeutic tasks. The wise choice of speech therapy procedure depends on ensuring child with full sensory access to the morphonological structure of the speech string, i.e. to the stream of syllables containing morphemes (units coding meaning) that consist of phonemes (units enabling their distinguishing and recognition; K. Krakowiak, B. Ostapiuk 2018). In case of the right choice of measures supporting communication (e.g. using the phonogestural speech visualization method), the prognosis is usually successful. The unreflective and persistent use of the methods based on improving hearing despite aphonemia or deep dysphonemia only or premature resignation from developing speech and limiting the communication with the child only to sign language can be quite dangerous.

The development of communicative speech in properly facilitated conditions – with the use of supportive methods – allows for communicating freely with people who use supportive measures efficiently and using written forms of communication. Moreover, it enables achieving a high level of language competence. Even when the self-control of speech is very hindered or impossible, which is why the correct pronunciation cannot be achieved and, as a consequence, communication speech is incomprehensible to strangers, the internal speech still is held in phonic language, which means that a person with hearing impairment has access to national and universal culture. The most important postulate that results from the research is the concept of mutual adaptation between interlocutors: both hearing and deaf/hard-of-hearing one.

PRACTICAL PROPOSALS RESULTING FROM ANALYSIS OF RESEARCH RESULTS

The practical effect of the conducted research was the development of the concept and detailed language education program (K. Krakowiak 2012, pp. 329–414; 2016c) as well as the proposals for changes in the educational system adjusted to children and adolescents with special educational needs caused by hearing impairments (deaf, severely hard-of-hearing, hard-of-hearing (K. Krakowiak 2016b). Among these proposals, there is a model of the strategy based on matching methods and programs of language education according to the special needs of individual person, concerning the diagnosis of their hearing ability. All things considered, such a proposal can be included in the following points:

- 1) Functionally hearing children (no dysphonemia) – monosensory auditory-verbal strategy oriented towards the direct inclusion in hearing communities.
- 2) Slightly hard-of-hearing [mildly hearing-impaired] children I (with mild dysphonemia) – multisensory auditory-verbal strategy oriented towards direct and supported inclusion in hearing communities.
- 3) Slightly hard-of-hearing [mildly hearing-impaired] children II (with moderate dysphonemia) – multisensory auditory-verbal strategy oriented towards supported indirect inclusion, i.e. with the help of an assistant or an assisting teacher, in hearing communities.
- 4) Moderately hard-of-hearing [moderately hearing-impaired] children I (with severe dysphonemia) – multisensory visual-auditory-verbal strategy supported by early teaching of reading, oriented at supported and indirect inclusion, i.e. with the help of an assistant or an assisting teacher, in hearing communities.
- 5) Moderately hearing-impaired children II (with profound dysphonemia) – multi- sensory visual-auditory-verbal strategy supported by speech visualisation with the use of cued speech/phonogestures and early teaching of reading, oriented towards supported and indirect inclusion, i.e. with the aid of a cued speech/phonogestures transliterator, in hearing communities.
- 6) Functionally non-hearing [deaf] children I (with aphonemia, showing preference towards communicating with gestures and facial expressions but capable of perceiving non-language sounds) – multisensory visual-auditory-verbal strategy supported by speech visualisation with the use of cued speech/phonogestures and early teaching of reading, oriented towards indirect inclusion, i.e. with the aid of a cued speech/phonogestures transliterator, in hearing communities.

- 7) Functionally non-hearing [deaf] children II (with aphonemia, descendants of non-hearing families and hearing families, showing marked preference for communicating with gestures and facial expressions) – bilingual visual-verbal strategy oriented towards direct inclusion in non-hearing communities and with the help of a sign language interpreter, in hearing communities.

When selecting the strategies, one can choose between the following linguistic education methods for children with hearing impairments, which have been developed during the history of special pedagogy and speech therapy:

- 1) Methods of speech therapy and facilitating the sound language:
 - a) Methods focused on improving hearing and monosensory compensation (auditory, monosensory methods).
 - b) Methods based on improving hearing and multisensory compensation (polysensory, e.g. auditory-verbal method (A. Lorenc 2015), the simultaneous-sequential method [metoda krakowska]; J. Cieszyńska, M. Korendo, Z. Orłowska-Popek, ed., 2010).
 - c) Methods focused on improving hearing, multisensory compensation and supporting speech visualization (supporting methods, e.g. cued speech/phonogestures).
 - d) Methods focused on improving hearing, multisensory compensation and supporting use of writing.
- 2) Methods focused on using writing and written version of language (including methods based on the use of fingerspelling and performing the successive sequence of letters with the use of conventional hand/hands movements).
- 3) Methods of communication abilities development with the use of signs and sign languages:
 - a) Traditional ways of using signs in education.
 - b) The concepts of bilingualism in linguistic education of non-hearing children.
 - c) The concept of ‘Total communication’ (A. Korzon 1996).

Even just naming the methods of linguistic education makes us realise that their selection is not an easy task. While adopting the Hippocrates principle of all therapy – ‘First do not harm’ – there should be taken into consideration the neuro-linguistic aspect of child’s brain development and the formation of the biological basis of their language in accordance with the nature of this process. Therefore, one should strive to stimulate and support the natural speech development, eliminating the delaying factors and avoid those that disturb it by causing disturbances in the eurhythmy of language activities. That is why, it is recommended to use

such methods that contribute to the integration of multisensory observations and the multiplication of eurythmically acting synaptic connections in CNS. It is not advisable to introduce the methods which may contribute to the modification of the way the language functions or even cause language disparity and social disconnection. For this reason, the decision regarding the use of sign language requires caution and consideration.

SUMMARY AND THEORETICAL CONCLUSIONS

Children with hearing impairments, just like all human children – regardless of their individual properties and auditory functioning – are born with, characteristic to each human, ability to communicate with other people and to create their own mental reflection of reality, an important part of which, constitute the logico-linguistic cognitive models. Such ability creates the basis for child's development as homo loquens – a speaking social being. Hearing impairment may be the cause of the disruption in natural process of sound language acquisition in the course of contacts with speaking people in a family environment. It is not, however, a barrier preventing the acquisition of language.

Based on the observation of the development of perceptive ability in people with different degrees and types of hearing impairments, it may be concluded that in the abilities structure there are being formed the patterns of fishing out the elements which are similar, repetitive and permanent in all other people's behaviours. Not only in the sounds of articulated speech but also in facial expressions, gestures and articulation movements, as well as in phonogestures (if they are used properly by parents and teachers). It can be said that the search for a stream of few, easy-to-grasp units that encode meaning - phonemes in syllables - is a property of human brain function and its method of "lingualisation" of its activities by their "phonemification".

The phoneme in its essence – once considered a purely theoretical construct of linguistic thought (N. S. Trubiecki 1970) – is a neurolinguistic model of unit of the structure of language activities, bonding two levels of brain activity: perception and production of speech signals, and linguistic reflection of reality, i.e. creating a linguistic image of the world. Primarily, phonemes are the matrices of perceptual activities: distinguishing and recognizing elements of speech sequence - sounds in syllables. At the same time, they are patterns of units of the structure of articulation activities which give phones the properties that enable them to be distinguished and recognized.

Their formation can be approximately described by using the metaphor of crystal formation. Still in mother's womb, in child's brain there are formed the beginnings of these patterns by capturing repetitive elements of auditory sensa-

tions. After birth, when the child not only listens to others but also more and more actively sends out and receives the sounds from the environment, crystals-phonemes are being filled with constant features captured from the sensations given by listening to themselves and learning about the kinetic and kinaesthetic side of their own speech organs. The crystals grow. They become more and more durable and fuller. They attract permanent features of vibration, permanent features of articulation movements available to the eyes, and permanent features of sounds that are repeated in the statements of loved ones and in identical sounds that babies can pronounce themselves. After some time, the crystal network of the phonological system is full and ready to pick out from the sound chaos of the surrounding world the sounds that have linguistic value and can encrypt meanings.

At the level of perception, language activities are based on the recognition of syllables and phones in a fast-flowing speech stream, which allows to recognize their combinations and sequences – words and phrases – and assign them meanings. The correct perception of the speech string allows for automated (without the necessity of reflection) uttering of the same words and sentences in a way that they contain the full set of features which are necessary for clear identification of individual sequences. The sound does not have to be identical but it must be adequately diversified. The classic situation of hearing the stream of speech is as follows: if I hear well what you say in a language that I know, means that at the same time I know clearly what to do to utter what you are saying. I know clearly (intuitively) how you do it, although I do not need to have an explicit (descriptive) knowledge about your breathing, phonation and articulation activities. I can repeat sequences stored by short-term memory. The syllables and phones realised by different people even though they sound differently and have different acoustic forms, they contain the features that enable them to be distinguished and recognized. The ability to use articulated sounds in such way determines the ‘phonemification’ of the functions of brain and its ‘lingualisation’. It can be said that the basis for ‘phonemification’ is to develop consistency between perceptual and articulation activities. Phonemes are the nodes of this coherence.

In the strict coherence between perceptual and articulatory (transmitting) activities lies the secret of language as an amazing being that is an individual mental being, existing in the form of ordered activities of a single brain, and at the same time it is a code for the transmission of psychological content by persons entering into various communication relationships. This is possible because language is also a socially codified semiotic system, developed by a chain of human generations belonging to a cultural community.

The most important function of language is that it enables people to meet mentally, that is, it allows for communication interactions and cooperation in the community. Such function is based on the properties of sign. This phenomenon is

described – initially and in a simplified manner – by repeated often by the structuralists and their students metaphor of glass or mirror. The system of language signs present in the mind of an individual is directed towards reality, which it reflects and shows in order to simultaneously reveal this reflection to other minds thanks to the ritual of interpersonal agreement and exchange of meanings.

Reflecting has by no means the concrete-pictorial character. The language reflects the reality that is recognized, categorized and logically ordered and interpreted in a cultural code, which is based on the one hand on inductive-deductive resulting, and on the other hand on the convention of figurative thinking, which uses the community resources of comparisons, metaphors and idiomatic expressions. The ritual of meanings exchange is based on the adoption of a community pattern of categorization, hierarchization and time-spatial ordering as well as cause and effect of objects, phenomena and relationships between them. One can, at least partially, reach the significations based on inductive-deductive performance through direct cognitive experience. Whereas, the figurative meanings can only be learned through communication experience, by interacting with other people and with cultural products (especially by reading written texts).

Language in its individual form is a system which organizes human cognitive activities and their interactions with other people. In the process of language formation in the mind of a child with hearing impairment, the paradoxical duality of this process, which is a universal property of language acquisition by children, is revealed with particular clarity, namely the combination of personal cognitive and sign-forming activity with the interiorization of the language used by the educational environment. Every child – while acquiring the language of the social community in which they live – creates this language for themselves all over again. In the case of hearing loss, the more difficult the child's access to the community language is, the greater the need for creativity. That is why children with hearing impairment and groups of people with hearing impairment indicate a certain excess of language creativity. This phenomenon cannot be understood and explained using neither terms related to pathologies nor constructs related solely to language deficits.

Hearing impairment hinders the development of the phonological system and the coherence between perceptual and articulation activities in a child's mind. However, the child's brain works according to the rules, which are characteristic of all people – it seeks in the arriving impressions, what is constant: different and similar. The brain collects knowledge about the world and looks for language signs which organize and express it. Impaired hearing, however, receives a different set of sensations, although the other senses work properly. The ability to perform speech organ movements is not limited. Nevertheless, it cannot achieve proper sensory-motor integration. Traditional methods of speech therapy

and education provide the phonic language in incomplete and distorted form. The effort of a child's mind leads to the creation of a different system of phonemic units (dysphonemia) or does not produce such a system (aphonemia). For this reason, I am looking for substitute systems, such as letters or the corresponding fingerspelling signs. Thus, it is difficult or impossible to synchronize the language activities of a child with an impaired hearing, with the activities of hearing interlocutors.

As a consequence of described phenomenon, in the experience of children with hearing impairments, language appears as a dualistic and inconsistent being: firstly, it exists as an absolutely separate creation, enclosed in the individual brains of people who meet, while in its second form – as a social, community being – it is not fully available. The dichotomisation and inconsistency between the language of the hearing community and the idiolect of a person with hearing loss, constitute the essence of the person's communication difficulties and limitations of the language experience. These problems are visible in the form of misunderstandings in everyday relationships with hearing people. Their most severe effects, however, occur as a result of limiting such relations and disconnecting people with hearing impairments from their family, educational and local communities.

Developmental deficits (cognitive and language), which arise as a result of insufficiencies in communication experience, have nothing to do with deficiencies in development potential and activity to overcome barriers. People with hearing loss are, first of all, lonely language creators, the authors of created in their internal speech, in a language unknown to anyone, hidden messages for themselves and the absent recipients. Signs and sign languages are their creation only when they have the opportunity to meet people with similar needs or people willing to use gestures and facial expressions in communication. It is worth realizing that people with hearing impairment who speak, usually experience difficulties when trying to communicate in the phonic language with each other. Their hearing capacity, ways of speaking and languages are different and inconsistent. That is why they need to communicate using gestures and facial expressions. This is an alternative, substitutive way. For this reason, they are happy to teach one another this way of communication.

Consequently, there occur complicated processes. In the minds of the deaf, the new sign codes are emerging. They are implanted on the trunks of phonic idiolects and powered with signs and structures derived from sign language (used in the given environment). The process of merging and unification of these individual codes leads to a gradual unification of sign language of the environment. At the same time, however, it leads to the social isolation and social alienation of entire groups of deaf people.

Describing sign communication by using one term – sign language – simplifies the picture of reality rich in facts which are difficult to compare and classify. It is because there are numerous ways and functions of using signs by different people in various communication situations. There are also different types of sign codes. The variety of codes cannot be confused with the variety of signing styles. In the area of linguistic reflection, the possibility of broadening the language definition in such a way that would embrace all sign codes, including environmental variations and idiolects, without artificially assigning them a structure analogous to phonic languages and without false generalizations, is questionable.

Sign language and all other ways of communication with the usage of signs are worthy of attention and respect as products of the creative activity of entire environments of people with hearing loss, their relatives, and friends. Above all, however, the phenomenon of sign creation and the transformation of their sets into two-class systems – the mature languages – deserve knowledge and explanation. Nevertheless, it is wrong to ascribe a priori all forms of signing, the identical properties. Moreover, in particular, all persons with hearing impairment should not be expected to have the same capability to understand sign language and to sign, as well as the ability to use the services of translators. The dichotomous division into signing in Polish Sign Language (PJM) and the Signed Polish (SJM) is also profoundly false. Both of these concepts have aspirational character and derive from educational program conceptions (see B. Szczepankowski 1999). In reality, it is difficult to find the “clean” forms of such codes in use. The idea of unification of sign languages is one of those utopian ideas that are justified by noble aspirations, but in practice – especially when implemented under coercion – lead to irreparable harm to individuals and entire groups of people with hearing impairments. The deaf have the right to create sign languages and to unify them spontaneously. It is harmful to stimulate this process artificially, as well as the excessive interference of hearing ideologists who usurp the position of “better knowing”. Whereas, the research on various types of sign languages: both natural and artificial, deserve further development (P. Wojda 2015a, 2015b).

Looking at language problems of people with hearing impairments from a wider cognitive perspective of language sciences and people’s language communication, it is worth to see it as a chance to reveal the essence of the discrepancy between the language traditionally understood as - a social being, which is relatively permanent - the code used by the community, and the languages of individuals, idiolects in the phase of dynamic development and transformation. In the language used by the communities of hearing people, the meanings of words and expressions are also not invariable and stable. Changes to the conventional meanings of words are continuous, but usually, they are hard to see.

Individual differences in the understanding of these meanings can be imperceptible. They usually manifest themselves in difficulties in communication and

interpersonal conflicts, as well as in ideological differences, social conflicts and propaganda political fights, in particular manipulation of meanings in politics and advertising.

The experience of communicating with deaf people and observing their struggle with language access issues allows to free oneself from the universal illusion of the stability of meanings of language expressions and to get closer to understanding its most important humanistic function, namely, the one which involves facilitating the creative activity of the human who participates in meeting with another human (other people) and makes an effort to interact with them, by communicating emotions, feelings, will and knowledge. Interpersonal exchange of mental content requires constant agreeing on meanings, often even negotiating them. In such an experience, language is constantly being reborn and developed. Caring about quality of communication between individual persons and entire social communities determines durability and development of these communities, as well as durability and development of human civilization.

In this way, language is first of all, a system of signs used to reflect and describe the reality and to discover the laws and principles that guide it. In this sense, it is the substance of surrounding us logosphere, i.e. the sphere of gathering individual and community experience, organising it in the form of various types of narratives, constations and theses, checking their truthfulness and arranging it in the form of a system of knowledge about the world. The image of the world contained in the language is by no means as lasting as it would seem to theorists. It is rich and it undergoes constant changes, even though it consists of permanent elements and is created according to an established ritual of language activities – the ritual of exchange of meanings.

Language defined in such way is – belonging to using it community – a system of mutual sharing of one's own mental resources and exchange of fruits of experience, as well as searching for the sense of cognizable truth. Therefore, the goal of linguistic education and speech therapy for children and youth with hearing impairment is to nullify barriers in access to the logosphere, that is, to the language products of this community of which they are full members. The art of communication in extremely constricted conditions, which we learn to support people with hearing loss, can become a model of activities in the area of language culture and the culture of communication.

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