

DEAFNESS

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Linguistic education and logopedic therapy in the program for the early support of the development of children with profound hearing impairments

SUMMARY

The goal of the author is to begin a wide-ranging, professional discussion on the individual selection of methods of linguistic upbringing and logopedic therapy for special developmental and educational needs of hearing-impaired children. This discussion is necessary in view of changes in the medical care of hearing-impaired persons. The essence of changes lies in that there has been an increase in the number of children that have an opportunity to develop the hearing functions of the brain owing to sensory stimulation, using hearing prostheses (hearing aids and cochlear implants). The child's chances are the greater, the earlier they are fitted with a well-selected auditory prosthesis. The child fitted with auditory prostheses, however, is not a perfectly hearing child. Individual benefits from using them vary in individual persons. A hearing-impaired child needs logopedic care and linguistic upbringing even when they seemingly respond well to sounds. The methods of management should be carefully adjusted to individual developmental needs and take into consideration a thorough and comprehensive diagnosis of the child's linguistic and cognitive activities.

The objective of the article is to define the tasks of specialist teams taking measures under the programme of early assistance to development of profoundly hearing-impaired children. These measures should be addressed to families and their social environments. This is justified by the developmental needs of every child, arising not only from deficit in perceptual ability but first of all from the very essence of development of man as an integral being: biological, mental, socio-cultural and moral-spiritual. The program of activities should comprise all developmental needs of a child.

Keywords: hearing impairment, hearing-impaired child, special developmental and educational needs of the hearing-impaired child, linguistic upbringing, logopedic therapy, aphonemia/dysphonemia

Early assistance to the development of children with profound hearing impairment constitutes a difficult and complex task, both for the families and the teams of specialists. It might seem that the progress made in the field of audio-prosthetics can remove all the limitations in this area. In fact, although the use of modern prostheses (hearing aids and/or implants) does provide better developmental opportunities for this group of children, it also opens a world of as yet unknown problems which require a search for new knowledge, logopedic research and pedagogical consideration.

The revolutionary progress in the field of electroacoustic technology and in the production of prosthetic devices, paired with the advancement of prosthetic ear surgery and followed by the discovery of the phenomenon of otoacoustic emission and the development of methods of diagnosing the physiological sensitivity of the organ of hearing as well as methods of detecting damage to this organ in newborns, have changed the situation of the families raising children with hearing impairments. The essence of the change lies in the increase in the number of children who have a chance of developing the auditory functions of the brain owing to sensory stimulation with the use of either prostheses that change an inaccessible stream of sounds into sounds accessible to the damaged ear or of implants that convert a stream of sounds into a stream of electric impulses delivered directly to the neurological system. The earlier the child is provided with an appropriate prosthesis, the better his prospects. The provision of prosthesis does not mean that the damage to the organ has been repaired or that the natural hearing ability has been restored. A person using a prosthesis is not a person hearing perfectly even though they are functionally hearing. A child provided with auditory prostheses needs logopedic and psycho-pedagogical care even when he seems to fully respond to sounds. Multidimensional support to the linguistic development of each hearing-impaired child remains necessary.

The support should encompass the whole of the child's development and include not only the narrowly-understood logopedic therapy, but also the broadly-defined linguistic upbringing, i.e. guidance and aid. If it is required, the child should also be assisted with the use of specialist – and suited to his individual needs and abilities – methods of stimulating and improving his language skills (more on the subject: Krakowiak 2012). The foremost goals of linguistic upbringing of infants and toddlers are full inclusion of the child in the family and protection from the threat of social exclusion resulting from lack of common language between them and the people closest to them.

The aim of this article is to define the tasks of specialist teams that take measures under programmes of early assistance to the development of children with profound hearing impairment. These measures should be directed at the families as well as their social environments. This is justified by each child's developmen-

tal needs, arising not only from the deficit in his perceptual ability, but, above all, from the very essence of the development of a person as an integral being: biological, mental, socio-cultural, moral and spiritual. The programme of actions should encompass all the developmental needs of a child; it cannot be built on the basis of a one-dimensional model which reduces a person's humanity to particular rehabilitation needs. It cannot allow the artificial creation of needs in order to develop markets for products and services for which either parents or the state must pay. It cannot favour arbitrarily chosen methods, without giving careful consideration to the child's unique circumstances and developmental resources. Biologically, hearing impairment only affects a person's single sense organ; from the psycho-social perspective, however, it impedes interpersonal relations by creating a communication barrier. It is the need to remove or overcome this barrier that lies at the core of the special developmental needs of a hearing-impaired child.

The author's goal is to initiate a broad professional discussion on the individualised selection of methods of linguistic upbringing and logopedic therapy so that they can be suited to the special developmental and educational needs of children with hearing impairments.

PSYCHOLINGUISTIC, LOGOPEDIC AND PEDAGOGICAL BASIS FOR DIAGNOSING SPECIAL NEEDS IN CHILDREN WITH HEARING IMPAIRMENTS

The most urgent goal in logopedics and special pedagogy is to develop a comprehensive system of knowledge and a full set of individualised programmes of making spoken language available to all children with hearing impairments in such a way that their various developmental needs are addressed. As a result of early diagnosis of hearing impairments and the use of modern auditory prostheses the individual differences between children in this group have become more profound, which necessitates greater diversity of programmes and methods. Social care must be provided not only to the children whose auditory perception improves to the point of functional hearing due to the use of prostheses, but also to those for whom the use of appropriate prostheses, correct audiological care and consistent auditory education are not enough to enable them to differentiate between and recognise the essential segments of utterances as fast as those utterances are delivered. These children have auditory prostheses, they use the other senses and intellectual abilities and yet they are unable to fully follow the strings of linguistic segments of utterances.

There are many such children (for more information see Krakowiak 2012: 108–148). Owing to the use of hearing aids and/or auditory implants they learn to respond to auditory stimuli and create the representations of sounds of speech,

but they are not always capable of perceiving the full range of characteristics of the stream of sounds as these are being articulated. These children hear, but they cannot discern the sound of phrases consisting of strings of syllables organised by rhythm and intonation. The reason for this is that they do not obtain the amount of sensory data sufficient to create adequate mental representations of sounds, i.e. phonemes, and to acquire the ability to listen categorically. Categorical listening decodes the morphonological structure of a string of speech, which determines the ability to understand the meaning and sense of words one hears and utters (see Krakowiak 2015).

Categorical perception is a primary ability, which develops in foetal life according to the genetically determined dynamic of the development of logical-linguistic abilities of the brain. The brain of a child with peripheral hearing impairment – like all developing brains – is programmed to cognitively order sensations received from the outside world through the senses and to recognise the similarities and differences between them. However, since it does not possess the complete set of data, it encounters a cognitive barrier, which is known as a phonological barrier (Krakowiak 1995: 25 et seq.). The presence of this barrier results in a serious threat of a deficit in the development of categorical perception of language, which is known as *aphonemia/dysphonemia* (Ostapiuk 1997, 2016; Krakowiak 2012: 52 and others).

A deficit in the categorical perception of language blocks the natural process by which a child acquires the language of the community in which he is raised, namely the spoken language used by his family. All the special developmental needs of a hearing-impaired child originate from the above-mentioned threat.

Overcoming the phonological barrier is necessary for the inclusion of a hearing-impaired child in the family of which all the other members can hear and speak.¹ Full inclusion in the family – the primary, model community – determines the way in which the child is subsequently included in other types of communities: educational, social, neighbourly, professional and national, as well as in the universal human community.

A person is an integral being, but they are also a social being and their development occurs in the context of continual interaction with other people. This interaction requires effective interpersonal communication based on a common language ensuring maximum unambiguity of the content exchanged. The richness of content and the quality of relationship with others determine the quality and level of a person's integral development. Unambiguity and coherence of the knowledge about the world which a child acquires in his family environment are important aspects of their harmonious psychological development.

¹ Only about 5% of children with hearing impairments have non-hearing parents with whom they can communicate using sign language, thereby acquiring this language in a natural way.

Care of the integral development of a child with hearing impairment requires that his needs be considered from the broad perspective of education, language, and interpersonal communication sciences. It confronts parents and specialists with tasks which cannot be limited to ear rehabilitation, auditory education and speech correction understood narrowly as the correction of pronunciation (phonation and articulation). It is necessary to conduct a comprehensive diagnosis of the child's unique situation in his educational environment and to develop a strategy for modifying his living conditions so that all the genetically programmed developmental mechanisms, including the natural language acquisition mechanism as well as the development of speech mechanism, will start functioning.

Hearing correction and concern for accurate pronunciation are essential in logopedic therapy; however, they do not constitute the backbone of the programme of a child's linguistic upbringing. Linguistic upbringing, which is closely connected with mental upbringing, is primarily aimed at harmonious, integral development of a person – not only their mental development, but also their socio-emotional and moral-spiritual development, as language encompasses and permeates the entire human existence.

THE AIMS OF LINGUISTIC UPBRINGING

The primary aim of the upbringing of children with hearing impairments is not only to help them attain the level of hearing speech sounds which is comparable to the average, but also to help them acquire the language of the community into which they were born and in which they grow up, fulfilling their developmental potential. Language is more than an abstract concept realized through voice and accessible to the ear. Language is a system for the exchange of meanings, sense and intentions; the exchange occurs between human minds which are contained in bodies, but at the same time rooted in the experience of their ancestors and in the spiritual heritage of the culture developed by these ancestors. Language is a gift bestowed upon each child by the community though not in the same way as a house is bequeathed to a beneficiary. The gift of language resembles a different kind of inheritance – a family workshop or land that requires cultivation since the child himself must make the creative effort of linguistic functioning (more on the subject in Krakowiak 2013a). However, to function linguistically the child must have access to all the elements of the structure of the language system.

The linguistic activities of a human being are not limited to the hearing abilities of the brain or to phonation and articulation; they involve the whole body, organizing all its functions and giving symbolic expression to these functions as well as to the sense of a person's existence. This is why it must be concluded that focusing only on improving the functioning of the hearing organ is insufficient as it may lead to neglecting other aspects of the child's development. It is also

insufficient to use a mono-methodical approach, which consists in applying only one method of linguistic upbringing – in most cases the auditory-verbal method. This method appears to resemble most closely the natural process of speech development, but in fact, if it is used too rigidly, it may seriously disturb sensory integration, which conditions the harmonious course of the child's psychological development.

The mono-methodical approach was characteristic of the first, enthusiastic stage of introducing logopedic therapy programmes in the circles connected with the medical centres where prosthetic surgery was conducted. The authors of these programmes, convinced of the universality of the use of prostheses and motivated by the intention that the benefits of prostheses should be justified and adequately supported by methodologically correct research, rejected any activities aimed at supporting children's linguistic development, even in those cases in which prostheses did not bring the expected improvement in hearing. Currently, as the effectiveness of auditory prostheses, and especially cochlear implants, has been fully confirmed, and, at the same time, it is indisputable that auditory prostheses do not restore the natural ability to hear, do not help all patients in the same way, and are not a panacea for all the problems related to deafness, it is time for reflection based on broader scientific knowledge and for widening the spectrum of integrated support activities.

In cases where the effectiveness of rehabilitation based on the auditory-verbal method proves insufficient and speech does not develop successfully, a question arises about the way of communicating with the child. Traditional, stereotypical thinking follows the direct path to alternative communication in the form of sign language. This, in turn, inevitably results in the use of the prosthesis being practically abandoned and the ability to read becoming limited (it is not enough to see letters, or even recognise them, to read; reading requires the knowledge of phonic language, which cannot be learnt through observation or reproduction of written language). In addition, the child is excluded from the hearing family, the consequences of which are the same as those of social orphanhood.

And yet, there exist effective methods which help children with the most profound hearing impairment overcome the phonological barrier and naturally acquire phonic language in speech and writing. They consist in supporting hearing; they develop multisensory categorical perception and enrich communicative activity. At the same time, they multiply the effectiveness of the use of auditory prostheses and can be used complementarily with the auditory-verbal programme. One such method is cued speech, which has been widely used for fifty years (see Krakowiak 1995; Krakowiak, Sękowska 1996; Domagała-Zyśk 2009; Krakowiak 2013b). Furthermore, there are methods that support speech with the use of writing, such as the simultaneous-sequential method (Cieszyńska 2000), which can also be used together with the auditory-verbal approach and

cued speech. Studies in action in the field of logopedics prove definitively that these methods can be used complementarily. They are not mutually exclusive; on the contrary, they enhance the effectiveness of one another. To perceive them as competitive is professional incompetence.

Children with hearing impairments are no longer condemned to bear the consequences of the “fatal” and absurd choice between speech and sign language, made by their minders. There is a whole range of possibilities of learning both speech and sign languages, and even of learning other, i.e. foreign languages (Krakowiak 2011; Domagała-Zyśk 2013). Hearing-impaired people do not need to be deaf-mute, or be the Deaf, which allegedly means that they belong to a separate cultural community but in fact places them outside the hearing society and dooms them to a life in a kind of ghetto. They can be multilingual. They can be part of different communities (see Krakowiak et al. 2011), instead of being excluded and marginalised due to lack of common language.

Research and reflection on programming logopedic therapy should take into consideration the fact that the beneficial changes which have led to the new set of determinants of the development of hearing-impaired children are not limited to the revolutionary increase in medical knowledge and advancements in electronics and prosthetics. Of equal importance are the progress in neurolinguistics and developmental psycholinguistics, the development of logopedic theory and practice (Muzyka-Furtak 2015; Grabias et al. 2015), the development of new methods of linguistic upbringing of hearing-impaired children in the field of surdopedagogy [the education of the hearing-impaired] (Krakowiak 2012), as well as the emergence of surdoglottodidactics – the didactics of teaching foreign languages to the hearing-impaired] (Domagała-Zyśk, Karpińska-Szaj 2011; Domagała-Zyśk 2013) and the increase in the new philological knowledge about sign languages.

The foregoing scientific achievements create a completely new basis for the early assistance to the development of hearing-impaired children and for the programming of the education of such children at later stages of their lives. The shortcomings of the current system of social support and education in Poland result from difficulties with a rational and balanced use of all scientific and technological advancements. The essence of these difficulties consists in the absence of an ordered and coherent system of activities aimed at supporting families with hearing-impaired children. The main reason for the difficulty in satisfying individual needs is lack of early detection standard of their diversity and individual intensity, i.e. lack of standard diagnosis of functional hearing and categorical perception of utterances.

The choice of strategy and methods of linguistic upbringing should be made as early as possible and should be based on thorough, individual diagnosis of special needs, first developmental and then educational. The next step in the de-

velopment of care of children and young people with hearing impairments should consist in building a coherent system of social support for families, of early assistance to the development of children, and of education of children and young people. The system should include clearly defined tasks connected with linguistic upbringing and logopedic therapy.

THE ESSENCE OF SPECIAL DEVELOPMENTAL NEEDS OF AN INFANT WITH HEARING IMPAIRMENT

The theses included in the theoretical introduction to these considerations require explanation. The special needs of an infant with hearing impairment evidently result from a deficit in auditory perception. However, the change in the intensity of stimuli (the increase in the energy of selected acoustic waves due to the use of a hearing aid) or in their type (changing acoustic waves into electric impulses with the use of a cochlear implant) does not automatically begin the process of language acquisition. The use of auditory prostheses requires that the child learn not only to listen but also to function in the specific situation of communication with the world. The child's special situation must be thoroughly understood by everyone around him: specialists, parents, close relatives, family friends and neighbours.

The essential developmental need of a hearing-impaired child is to have living conditions that enable the stimulation of his creative linguistic potential and the natural processes of language acquisition and speech development. There is no way of acquiring the first language under artificial conditions of a laboratory or school. Children cannot be taught their first language in a logopedist's office or in a classroom; they lay the foundations of their first language themselves, i.e. create them for themselves (for their own private speech) as they actively interact with people and learn about the world. The first language emerges in children as they develop mentally and is based on the representations of reality that form in their developing minds. Specialists and parents can organise and improve the conditions for the process of language acquisition; however, they cannot programme the process itself.

The natural process of language acquisition happens in the family environment, where interpersonal relations trigger the child's subjective cognitive and communicative activity, leading to the emergence of a system of linguistic competences and skills in their brain. These competences and skills are revealed in behaviours that signify the development of the child's idiolect: a specific, creative and personal variety of the language of the community that the family belongs to. A child does not learn his first language through simple imitation of the activities of adults – although it might seem so if one made conclusions on the basis of the popular, simplified idea of the function of mirror neurons – but through his own

action, in which cognitive and communicative acts combine on multiple levels of neurosensory and mental activity in a uniquely human and genetically determined way. A child does not become a speaking person through “aping” but through a conscious and intentional use of models.

Imitation leads only to achieving the ability to communicate using protolanguage – a set of signals that also animals are capable of using. Human language is a system of symbols whose abstract and metaphorical meanings afford the maximum unambiguity in the conveyed content owing to the precise morphological structure of the code. The amusing thesis that “the ability to ape defines humanity”, which is repeated by those who seek to prove the theory of evolution by attempting to teach sign language to monkeys, must be rejected as ludicrous.

The language of the *Homo Sapiens* species is not protolanguage, i.e. a set of signals accessible to monkeys that can be learnt by imitation and taught by training; it is Logos – a multidimensional, hierarchical system allowing the symbolic-logical ordering of the knowledge about the world and sharing it with other participants of social life. The same is true about sign language, which no monkey has ever learnt. The exclusively human ability to create language and pass it on to others is a mystery, finding the solution to which remains the most important pursuit of humanities and social sciences. All the other scientific questions and the accuracy of the hypothetical answers to them depend on the assumed understanding of the idea of language. The question about how to pass phonic language on to people with hearing impairment and how to help them create their own idiolects is the fundamental one in the fields of logopedics and special pedagogy. The observation of the process by which groups of hearing-impaired children actually create sign language raises hopes that they are capable of acquiring phonic language.

Language and speech acquisition are personal and creative processes from the very beginning. The dynamic of the development of a child’s idiolect depends on the reserves of multisensory sensitivity and on the ability to perform ordered chains of brain activity leading from categorical perception and logical linking of various sensations to mental recognition and giving meaning and sense to the elements of reality as they are being learnt. This ability is the attribute that separates humans from all the other species living on Earth; it commences at the very beginning of the process known as language acquisition.

In fact, this process is not only the acquisition of the code used by a given community, understood as a special way of learning this code through internalisation, but it is also the process of creating this code anew in a personal way, of learning it through reformulating it in one’s own way and for one’s own purposes. A child’s language is always a new, personal language; it will serve them well if it precisely describes their growing knowledge about reality and if it is closely connected – in all layers of its structure – to the languages (idiolects) of other people living in the community in which the child lives and is raised.

THE MORPHONOLOGICAL BASIS FOR THE DEVELOPMENT OF A CHILD'S LINGUISTIC COMPETENCES AND SKILLS

A hearing child's linguistic competences and skills depend on the centre of mental processes which is a combination of two types of mental constructs emerging in the child's brain, namely phonemes and morphemes. Phonemes – rooted in the physical matter of strings of speech, which the child can hear already in the womb, as soon as their auditory receptor starts functioning – are mental representations of elementary receiving-transmitting units of utterances, or, to be precise, models of the elementary components of the process of recognising the structure of the linear sequence of meaning which is accessible to the senses. These models ensure the order and unambiguity of the language code due to the precise and economical nature of the phonological subsystem, of which they are components. There are few of them. They give a categorical order to perception and articulation processes owing to a set of distinctive features which characterise them and are easily perceptible to the brain. The ease with which they are recognised depends on multisensory perception. These features give the chains of phonemes ordered into syllables an intersubjective identity, which enables them to serve the purpose of communication and exchange of meaning between minds. A child's auditory processes are oriented towards detecting these features and models.

All the cognitive activities of a child are oriented towards perceiving differences and similarities, and recognising categories. This is true about both the process of constructing knowledge about reality, encapsulated in concepts which constitute the content of meanings of words, and the stream of speech, on the structure of which the children's attention focuses even before they are born, but especially in the first months of their life. It is owing to this orientation that the child's brain recognises the identity of the repeated units of language in a chain of speech and learns to give them meaning and then to use them to receive and send messages. This orientation of the child's brain represents the innate human ability to creatively acquire the language of the community into which the child was born.

The observation of the development of speech in numerous different children allows a speculation that the features and models of chain of speech units perceptible to the senses of each child are not identical, especially in the first stage of development. The sequence in which the particular senses become active and dominate differs, and therefore different features of the stream of cognitive activity become dominant. Thus, it is not the case that every human infant perceives the features of sounds described as distinctive by phonologists, and creates a list of phonemes according to some theoretical model. The brain of each child functions in a unique way. Nevertheless, living in a specific linguistic environment,

in a specific logosphere, which, in a way, fills the space between minds, every hearing child manages to access the common language by deciphering the morphonological code.

From the perspective of a child's perception of a speech chain, it is therefore necessary to see not only the external features of phonemes, which come from the socially based language of the community, i.e. the set of distinctive features typical of a specific class of sounds, but also the neurosensory dynamics of their development in a child's brain. During the earliest stage of the development of the ability to listen to human voice a phoneme emerges as a model of an elementary part of this ability, as a single search for a category.

The sensitivity of hearing and of the structures of the central nervous system to the similarities between the differences perceived simultaneously in the reception and production of communicative sounds constitutes the neural base for the development of speech. A child learns to perceive stable differences between syllables, i.e. rhythmical elements of a phrase, and, as a result, discovers their regular components, i.e. sounds. These discoveries are made as the child engages in communicative acts using all his linguistic development resources, i.e. not only their hearing and sight, but also the movements of the organs which are involved in the production of sounds: breathing, phonic and articulatory organs, as well as hearing, touch and proprioception, which control the effects of these movements. The child listens, but also babbles and then gradually uses his voice more and more.

Contrary to what one might imagine, a phoneme is not simply an image of a sound moving inside the brain in the form of an electrical impulse. Phonemes are not only abstract concepts which, as theorists believe, emerge in the minds of researchers as a result of cognitive activity on the level of metalinguistic (explicit, distinct) knowledge about sounds; nor are they just abstract concepts in the mature structure of the language system on the level of linguistic (implicit, tacit) knowledge; they are also (or even primarily) the primary models of human language activities, which determine the existence of sounds.

The emergence of sounds as physical beings is possible because of the primary ability to categorise sensations and the ability to make articulated sounds, which can be surprisingly different and yet unambiguously marked with distinctive features so that they can be immediately and easily identified mentally. The mystery of the phoneme lies in its accessibility to the minds developing within the same linguistic environment. The mystery of the process of language acquisition lies in the child's aspiration to learn the phonemic system and decode the language that adults use. Phonemes are lasting, unchanging and easily exchangeable components of the language system. Due to those "crystals of unambiguity" whose combinations in syllables, as well as in morphemes, words and sentences, "at-

tract”, “consolidate” and “transport” meanings from one mind to another, people are able to communicate so effectively that they can cooperate not only directly, but also via fixed utterances. Language – a phonemic code – is in fact people’s most essential asset as it allows them to achieve the level of socialisation which enables them to transcend biology, time and space, and to create countless utterances as well as narration, historical memory and culture.

At this point it should be firmly repeated: acquiring a language is more than just learning sounds of speech, imitating them and exploring meanings. It is a creative process of converting the learnt components of the code into an own idiolect. A child is not a passive imitator of the utterances of others but an independent and active being. Due to immediate identification of phonemes in syllables, he is capable of grasping morphemes, constructed of phonemes according to fixed rules and carrying meaning and sense. Because of their precise phonemic structure, morphemes are especially fit for the lasting codification of meaning.

The morphological structure of language is the basis for all its functions. Language acquisition consists precisely in decoding this structure. The mystery of the surprising speed with which infants decipher the language code lies in their brain’s ability to categorise. Language affords children access to the world of social relations and subsequently, gradually, to the knowledge encoded in language, i.e. to the so-called linguistic image of the world, developed by generations of language users.

The evident sign of progress in the development of speech as part of language acquisition is the first attempts to construct simple sentences and the creation of child neologisms, i.e. words and forms that do not exist in the language of adults but are constructed of morphemes in a logical way and prove that the child is linguistically creative as well as aware of the rules of the code. It is obvious that before the child can demonstrate such creativity in speech he must acquire sufficient linguistic knowledge in terms of understanding. This fast-growing hidden knowledge is the driving force behind the surprisingly quick development of a child’s linguistic competences and skills in the first years of his life.

Summing up this part of discussion, it is worth emphasising that a child’s first language is an original creation of his mind, an own idiolect, the language of private speech, and – if it is consistent with the idiolects of other people – also the language of external speech. The morphological subsystem of phonic language becomes “the conveyor belt for meaning” between the mind of a child and the minds of people in their environment. In this way, the child acquires the language of his family environment, which is usually his national language, in its full structure.

STRATEGIES FOR OVERCOMING THE PHONOLOGICAL BARRIER

Children who can hear, though not everything, have the potential for linguistic development which is typical of every human being. They make efforts to decipher the language code: by listening and looking, they try to identify language units in phonic strings of speech. The difficulty lies in the fact that as they are unable to discern a sufficient number of distinctive features which allow differentiating between syllables (and between the sounds within syllables), they create their own phonological system, which is inadequate, at variance with the language norm, insufficient, incomplete. They perceive particular sounds as identical because they are unable to differentiate between them. The mechanism behind this phenomenon was described in detail by Barbara Ostapiuk (Ostapiuk 2016) and adequately named as *homophonemisation*. It consists in difficulties with perceiving differences and in the incorrect identification of sounds (classifying sounds perceived as similar into the same category). The phenomenon itself is known as aphonemia/dysphonemia (Ostapiuk 1997; Krakowiak 2012: 52 and others)

The consequences of aphonemia/dysphonemia for the development of a child may be different, depending on the number of sounds subject to homophonemisation. They might be limited to confusing two sounds – or several of them – in reception, speech and writing (for example: *cebula* [onion] becomes *sebula*, *szebula* [the initial sound /ts/ is pronounced as /s/]) or *tebula*; *plotek* [small fence] may be confused with *młotek* [hammer]; *bulka* [bun] may be confused with *półka* [shelf]); they might, however, also take the form of a severe impoverishment of the phonological system, which makes the child's utterances virtually impossible to understand so that only the meaning of very basic ones can be inferred from their situational context. In such a case, the child perceives numerous words as homonyms, as they sound identical to him or her. Invoking the above-mentioned metaphor of “the morphonological conveyor belt for meaning” one can say that a slightly hard-of-hearing (mildly hearing-impaired) child uses a faulty conveyor belt, while a moderately hearing-impaired child – a badly damaged or incomplete one.

Different children experience different problems, depending on their individual levels of sensory-cognitive functioning. This is why it is so difficult to develop a uniform programme of teaching the hearing-impaired their national language. In some cases, supporting the imperfect hearing perception with writing proves highly effective. Alphabetic writing, especially in languages with the domination of phonetic spelling (like Polish), offers fairly precise and adequate representation of the phonemic structure of words and can therefore enhance differentiation

between apparent homonyms and help remember words. However, in cases of profound dysphonemia the use of writing is not sufficient; furthermore, it may contribute to the development of specific speech disorders described as grapho-genic dyslalia (Krakowiak 2012: 123 and others). The cued speech method, which eliminates all the deficiencies in differentiation and identification of sounds and makes phonic language fully accessible to the hearing-impaired child, has proved to be the most effective way of eradicating pathological homophonemisation and preventing aphonemia as well as severe and profound dysphonemia (see Ostapiuk 2016). Metaphorically speaking, cued speech enables the child to construct a fully-functioning “morphological conveyor belt for meaning”.

Children who cannot hear speech sounds at all and therefore have not constructed a mental “conveyor belt for meaning”, i.e. morphological subsystem, lacks the possibility of acquiring the language of the community and are condemned to learn about the world on their own. They create their own language of private speech, which is a specific idiolect devoid of features allowing intersubjective exchange of meaning, sense and intention. Spending time with non-speaking people and observing their rational behaviour, we can imagine their range of concepts, but our access to them is limited. In some cases, we can even realize the loner’s astonishing wealth of knowledge. It is therefore legitimate to ask questions about the possibility of “thinking without language” and to reflect on the nature and the neurosensory form of private speech in deaf and non-speaking people.

If children that share a similar language development deficit meet together in a group, for example at playgroup or at school, they immediately search for ways of exchanging meanings and create a common language of the group. Obviously, it is initially a protolanguage, an ungrammatical system of gestures and facial expressions. Soon, however, owing to their mental capabilities and their need to communicate, non-hearing (deaf) children establish a common system of signs, in which unambiguity is achieved due to the perceptible similarities and differences between the signs. Next, rules for combining the signs are created so that non-hearing children can construct sentence-like messages, in which the way the signs are combined results from the simultaneous-spatial ordering of the mental representations of components of reality and is different from the linear way of combining words in a phonic language. When this process is continued by subsequent generations, there emerges a more complex sign language, which is autonomous and contains its own image of the world, different from the images of the world encoded in phonic languages. As people speaking a national language communicate, via signing, with the non-hearing, the sign system becomes enriched with various components and rules based on the language used by hearing people. The former are mostly semantic units, while the latter refer to the ordering of signs modelled on syntax.

Sign languages emerged as a result of the tradition of educating hearing-impaired people in special needs schools, i.e. in a segregated education system. Their emergence is evidence of the richness of intellectual resources and creativity among people with hearing impairments, who manage to communicate even when they receive no help with accessing the language of the majority. Families communicating with the use of sign language create specific communities linked by a variety of ties: friendly, social and professional.

Currently in Poland there are no ghetto-like communities or communities characterised by intense cultural otherness in terms of lifestyle or system of values. This is why there is no homogenous sign language in Poland, but a collection of varied idiolects and particular languages. Attempts to standardise the Polish sign language are based on selected local varieties, which are extensively elaborated by hearing researchers and then offered to the non-hearing as more perfect than others. One characteristic phenomenon connected with studies of sign languages is attempts to artificially modify and enrich them.

Over the last decade, a substantial contribution towards the modification and dissemination of sign language has also been made by speaking and educated hearing-impaired people. After intensive rehabilitation and education, they enter adulthood and struggle to find their place in society. They demand attention and group autonomy. This phenomenon, combined with tendencies to use minority groups for political purposes by some political parties and groups as well as with promotional campaigns of companies offering interpretation services, has led to a common though mistaken conviction that sign language gives all people with hearing impairments full access to information, while the hearing-impaired themselves are a homogenous group, similar to an ethnic minority. This social myth, intentionally perpetuated by certain circles, interferes with the clear perception of the complex problems that hearing-impaired people face and hinders the introduction of solutions that are adequate to their needs.

Admiration for the linguistic talent and creativity of hearing-impaired children, as well as for sign languages themselves, should not obscure the fact that communicating with a sign language only condemns non-hearing people to social segregation and exclusion from the society. Even more importantly, it should not obscure the fact that young hearing-impaired children who come from hearing families but are educated in sign language are threatened with exclusion from their family even if their parents earnestly strive to learn elements of sign language. The specific simultaneous-spatial ordering of mental representations of reality elements is not accessible to hearing adults. Hearing parents cannot perform their parental role using sign language as it is spoken language that is their "language of the heart", i.e. the language in which they express emotions and values, and their language of knowledge about the world.

THE SHORTCOMINGS OF THE TRADITIONAL FORMS OF LOGOPEDIC CARE OF CHILDREN WITH HEARING IMPAIRMENTS, AND THEIR SOCIAL CONSEQUENCES

The oldest living generation of parents and logopedists can still remember the time (the 1970s and 80s) when clinics for children with hearing impairments adhered to the rule that a child was only referred to a logopedist when he could speak. Non-speaking children were in the care of special teachers and psychologists. The role of a logopedist focused on corrective activities. If it was found that a child was capable of uttering a few words and a logopedist was seeing him, the mysterious logopedic session took place behind closed doors while the mother sat in the waiting room. After few meetings with the logopedist, it was confirmed that the child was deaf and mute.

There were also cases of the most profoundly hearing-impaired children that were not seen by a logopedist at all. They were referred to special needs schools, where teachers struggled to teach them the Polish language, both in writing and in speech, while the children themselves used their own linguistic abilities to acquire and create their own language – a sign one. It needs to be emphasised again that the first language cannot be taught; it is created by the child in the course of his cognitive development – the child derives models of communicative behaviour by observing people in his environment and tests the usefulness of these models for communication. In a special needs school what proved effective was gestures and facial expressions: the precursors of sign language. Despite valiant attempts to learn words and sentences in the Polish language, the students of special needs schools never discovered and never acquired the morphological code of this language; they therefore forgot the memorised words and sentences. However, there were cases of their peers with equally profound hearing impairments who, being raised with hearing people and educated in comprehensive schools, achieved astonishingly high levels of linguistic competence and skills.²

As a result of the situation described above, there developed a fashion for training so-called “therapist mothers”, who were given detailed instructions on how to “rehabilitate hearing loss” and “train their children to speak”. Those determined mothers embraced the principle that “a mother should sacrifice herself for her child” and abandoned their careers, social life and personal development to dedicate their lives to the “rehabilitation and training” for the good of their children. They filled their own and their children’s lives with gruelling work, and then often discovered that the results did not meet their expectations and were disproportionate to the effort invested. Success was only achieved by those mothers

² Successful outcomes of individual education of hearing-impaired people have been observed in the history of education since the 16th century.

whose hearing-impaired children were able – with the help of simple hearing aids – to receive sounds at the level of 50 dB at frequencies up to at least 6000 Hz. The mothers of children with the most profound hearing impairments could not rejoice in accomplishments; they also usually did not understand the reasons behind their failure since specialists did not attempt to find an objective explanation. Instead, they blamed the lack of speech development on the mothers themselves or on the children's disorders associated with hearing loss. As a result, the mothers intensified their pseudo-therapeutic efforts, thus exposing their children to psychological overload.

It is only years later that some non-hearing (=deaf) 30- and 40-year-olds show the effects of psychological trauma resulting from this “rehabilitation violence” and the loss of mother, who – influenced by the above-mentioned harmful ideology – assumed the role of a therapist and teacher, thus abandoning motherly behaviour. After years of such specific social orphanhood, children of those mothers seek friendship and love among the deaf; despite the fact that they speak relatively well, they learn sign language and create new signing communities.

One result of this social phenomenon is the revival the movements which oppose therapy and the use of prostheses, reject the ideas of inclusion and educational integration of the non-hearing and promote the cultural autonomy of the deaf, seen as a specific social minority. It is worth noting that in Poland these movements are delayed: they are gaining strength while in other countries they are coming to an end. Their most sinister effect consists in disturbing the sense of mental identity of numerous hearing-impaired people who spent their childhood struggling with their hearing loss as a disability and then, on the threshold of adulthood, were introduced to the idea that they should take pride in their deafness as a distinctive feature defining their identity. Unfortunately, the path to regaining dignity that this idea seems to open is illusory. In reality, it triggers a different kind of excessive concentration on one's own disability/otherness, thus distracting attention from one's actual psychological resources, and arresting development. This phenomenon is becoming even more common because the members of new hearing-impaired communities easily fall victim to ideological manipulation by those who politically benefit from escalating conflicts between social groups and waging a struggle for cultural autonomy for social minorities and subcultures. They also succumb to another form of exploitation, which is ubiquitous in a consumer society, namely the practice of creating needs to ensure markets for products and services offered by companies established solely to supply these products and services, and using social manipulation as a marketing technique.

To sum up this part of discussion, it should be emphasised that hearing-impaired people in Poland need not only hearing loss rehabilitation and speech therapy, but, above all, upbringing methods giving them confidence in their abili-

ties and a sense of dignity. They also need conditions in which they can develop adequate self-esteem so that they can build up motivation for self-education and courage to live responsibly in a diversified civil society.

AN INTEGRATED PROGRAMME OF SUPPORT FOR FAMILIES
RAISING HEARING-IMPAIRED CHILDREN, OF EARLY
ASSISTANCE TO DEVELOPMENT OF INFANTS,
AND OF EDUCATION OF HEARING-IMPAIRED CHILDREN,
YOUNG PEOPLE AND ADULTS

Hope for improvement in the situation of the next generation of children and young people with hearing impairments is rising mainly due to the fact that most modern logopedists, specialists in deaf education and teachers have finally abandoned the old debate between oralists [supporters of the system of teaching the non-hearing to communicate using speech and lip-reading] and the advocates of sign language, and undertaken activities based on realistic individualised approach to the special needs of hearing-impaired children. These needs must be diagnosed individually; they necessitate a selection of methods and creation of a programme of linguistic upbringing for each infant, toddler and pre-school child that requires help; the programme must take into account the child's bio-psycho-social situation considered holistically. Specialists are learning how to cooperate with individual families. Parents, on the other hand, are gradually learning to search for solutions appropriate for their child instead of submitting blindly to opinions imposed on them (more on the subject in Krakowiak 2015). We have understood that choosing the same path for all hearing-impaired children hinders their development and causes harm to many people and whole families, whereas an approach open to individual needs creates conditions for their social inclusion in various communities and gives them personal and group autonomy.

The population of hearing-impaired people is not – and has never been – homogenous. The diversity of special communicative and educational needs of children belonging to this group was recognised by teachers in earlier periods, especially by the supporters of reintroducing sign language into education (Pietrzak 1993a; 1993b). However, it was only in recent years that the range and variety of this diversity was revealed (Krakowiak 2006; 2014). The diversity of individual needs is the reason behind the demand for a carefully considered multi-method approach in linguistic upbringing and for a search for solutions focusing on the person who was born into a specific family, has the right to live and develop within this family and then to join other social and educational communities.

Obviously, care and attention must also be given to those children who already know sign language, which they acquired as a result of being raised in

signing families; as well as to those who – after a thorough analysis of their potential, abilities and preferences – should be offered education in sign language. An individualised selection of methods of linguistic upbringing constitutes the most essential and the most difficult task in the process of programming the early support of development and education of hearing-impaired children.

THE TASKS FOR TEAMS OF SPECIALISTS UNDERTAKING ACTIVITIES UNDER PROGRAMMES OF EARLY ASSISTANCE TO DEVELOPMENT OF CHILDREN WITH HEARING IMPAIRMENTS

Undertaking activities adequate to the individual needs of a child requires primarily a reliable system for functional diagnosis (lack of functional diagnosis is the main shortcoming of the current care of hearing-impaired children in Poland). Only a professional analysis of the hearing threshold and categorical perception of speech sounds can form the basis for forecasting further progress and anticipating possible language acquisition disorders, and therefore also for the selection of prevention strategies and the choice of linguistic upbringing methods. Hearing of speech sounds results from complex activities of the brain. Diagnosing this aspect of hearing cannot be considered as equivalent to audiological diagnosis. What is necessary is a professional audiophonological diagnosis, establishing the level of aphonemia/dysphonemia and thus revealing individual needs related to language communication and acquisition. Depending on individual needs, prevention measures may be based on the following central strategies:

- a) when either no dysphonemia or mild developmental dysphonemia is found: improve communication in phonic language with no special means of supporting multisensory perception;
- b) when either moderate or severe developmental *dysphonemia* or *aphonemia* is found: improve communication in phonic language with the use of specially selected methods of supporting multisensory perception and first language acquisition, for instance, the verbotonal method, the simultaneous-sequential method (Cieszyńska 2000), cued speech (Krakowiak, K., 1995; 2012; Domagała-Zyśk 2009);
- c) when irreversible aphonemia is found: use alternative means of communication, i.e. sign language (there exist different varieties of sign language and different ways of using sign language in education; it is advisable to use the variety that is common in the person's environment, especially in the family).

The adoption of the last strategy does not mean that the person should not be enabled to learn their national language. Currently, the knowledge about factors determining bilingualism (i.e. developing competence in both phonic and sign

language) in profoundly hearing-impaired people is not sufficient to provide the basis for didactic programming (Krakowiak 2016). Much more is known about bilingualism in mildly and moderately hearing-impaired people, as well as in people with acquired hearing loss. There has also been a noticeable increase in the knowledge about the possibilities of teaching hearing-impaired people other phonic languages, i.e. foreign languages (Domagała-Zyśk, Karpińska-Szaj 2011; Domagała-Zyśk 2013).

A multi-method approach which focuses on an individual and is adequate to their special needs places responsibility on parents, logopedists and teachers; it also confronts the organisers of support and education with the task of creating an organisational framework for linguistic upbringing, logopedic therapy and general education for every hearing-impaired child. The individual selection of linguistic upbringing methods and ways of supporting communication is currently the most important task in the programming of education for the hearing-impaired in Poland. This task requires constant broadening of specialist knowledge and providing professional development services for therapists and teachers. It is also necessary to ensure that individual children's special needs are determined objectively since currently there is a strong tendency to use marketing strategies to artificially create disabled people's needs so that profit can be made by exploiting charities or welfare state.

The above-mentioned aimed activities entail the following specific detailed tasks:

1. develop a standard diagnosis of functional categorical hearing (establishing the degree of aphonemia/dysphonemia) and introducing it as a mandatory continuation of hearing impairment screening;
2. develop a standard test of communication preferences and introduce it as a basis for predicting a child's language development;
3. develop main standard strategies for linguistic upbringing with the use of methods selected for typical groups of children:
 - a) functionally hearing (no dysphonemia) – monosensory auditory-verbal strategy oriented towards full and direct inclusion in hearing communities,
 - b) slightly hard-of-hearing [mildly hearing-impaired] I (with mild dysphonemia) – multisensory auditory-verbal strategy oriented towards supported and direct inclusion in hearing communities,
 - c) slightly hard-of-hearing [mildly hearing-impaired] II (with moderate dysphonemia) – multisensory auditory-verbal strategy oriented towards supported inclusion, direct and indirect, i.e. with the help of a hearing assistant or an assisting teacher, in hearing communities,
 - d) moderately hard-of-hearing [moderately hearing-impaired I (with severe dysphonemia) – multisensory visual-auditory-verbal strategy sup-

- ported by early teaching of reading, oriented at supported and indirect inclusion, i.e. with the help of a hearing assistant or an assisting teacher, in hearing communities,
- e) moderately hearing-impaired II (with profound dysphonemia) – multisensory visual-auditory-verbal strategy supported by speech visualisation with the use of cued speech and early teaching of reading, oriented towards supported and indirect inclusion, i.e. with the aid of a cued speech transliterator, in hearing communities,
 - f) functionally non-hearing [deaf] 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 and early teaching of reading, oriented towards indirect inclusion, i.e. with the aid of a cued speech transliterator, in hearing communities,
 - g) functionally non-hearing [deaf] 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 indirect inclusion with the help of a sign language interpreter, in hearing communities;
4. develop standard strategies for linguistic upbringing of hearing-impaired children with associated disabilities, especially most frequently occurring ones;
 5. develop a minimum curriculum for children and young people with hearing impairments and substantial delays in linguistic development, to be implemented in special needs schools.

* * *

The aims of activities and the tasks for organisers of education presented in this article were also laid out in *Propozycje zmian systemowych w zakresie kształcenia dzieci i młodzieży ze specjalnymi potrzebami edukacyjnymi spowodowanymi przez uszkodzenia słuchu (niestyszących, słabosłyszających, niedosłyszających)* [Suggestions for system changes concerning the education of children and young people with special educational needs caused by hearing impairments (non-hearing, slightly hard-of hearing and moderately hearing-impaired)], a document submitted to the Polish Ministry of Education, and earlier in *Tezy do dyskusji w Zespole do spraw specjalnych potrzeb edukacyjnych powołanym przez Ministra Edukacji Narodowej (Zarządzenie nr 16 z dnia 24 marca 2016 r.)* [Theses for discussion by the Team for Special Educational Needs appointed by the Minister of Education (directive No. 16, dated March 24, 2016)], as well as in a paper delivered during

a conference for headmasters of special needs schools for the non-hearing and hearing-impaired.³ This article offers theoretical and practical substantiation for these aims and tasks.

The presentation of the foregoing considerations to the circle of Polish logopedists, as the main specialist group responsible for linguistic upbringing and logopedic therapy of children and young people with hearing impairments, raises hopes for immediate professional response to the proposals laid out here, in the form of both in-depth discussion, specific activities and a search for further effective solutions. The article intentionally focuses on the programme of early assistance to the development of a child, which results from the conviction that this approach is fundamental and optimal for language development. However, it must be emphasised that hearing-impaired people need logopedic help throughout their life, and, in cases of a substantial delay in speech development, linguistic upbringing and then linguistic education and logopedic therapy deliver beneficial results despite being difficult. What we need is modern methodological solutions and an efficient system of pedagogical and logopedic care.

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³ The conference was held in Długopól Zdrój on May 20, 2016.

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