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The Cued Speech system and its practice

CUED Speech Europa

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Introduction

The population of persons with hearing loss is immensely diverse and it is difficult to estimate the exact number of persons who call themselves Deaf/deaf/deafened/ or hard of hearing. The WHO estimates that there might be as many as 466 million persons (including 34 million children) all over the world who need rehabilitation services for their hearing loss. The problems of deaf and hard of hearing persons are not marginal. Preventing their social exclusion and creating communication communities is a priority task today.

Deaf and hard of hearing students can nowadays get good quality education not only in special institutions, but also in integrated and mainstream (inclusive) educational institutions. In order to support them, teachers, therapists, and other specialists working with deaf and hard of hearing population need support in acquiring innovative communication skills to meet the individual needs of their students.

The CUED SPEECH EUROPA project aims to promote the Cued Speech method supporting auditory and linguistic development in phonic national languages. The method has been adapted to several dozen languages but the project and the book itself concentrates on three of them: French (LfPC, Langue française Parlée Complétée), Italian (Parola Italiana Totalmente Accessible) and Polish (fonogesty). Cued Speech (CS) is a very simple technique that was created to support people with hearing loss who, despite the early rehabilitation, have difficulties in accessing the language. It enables them to communicate with other deaf and hard of hearing and with hearing people and their parents, friends, therapists, speech therapists and teachers in an accessible and precise way.

As authors of this book, we do hope it will be an informative and valuable source for all readers interested in education and support for deaf and hard of hearing persons, their families and other everyday communities.

Chapter 1:
Deaf and hard-of-hearing persons' challenges in speech perception

Written by Kazimiera Krakowiak

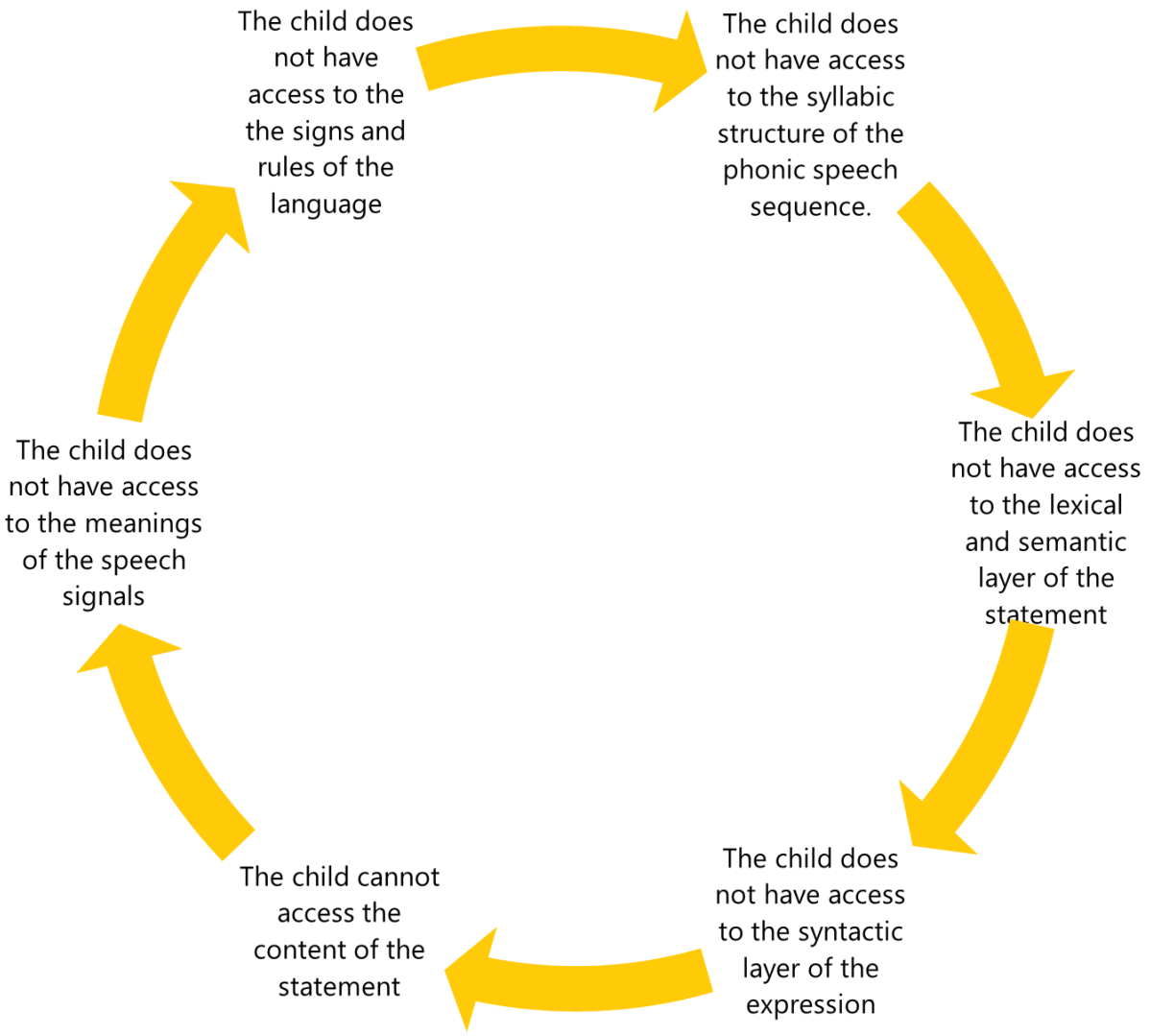
To understand the concept of Cued Speech requires an understanding of the nature of children's language and speech acquisition. The acquisition of phonics language requires the integrated activity of all of the child's senses, especially those involved in the perception and production of articulated sounds, namely hearing, vision, touch and vibration perception.

Learning to speak also requires the activity of the articulatory organs, auditory self-control and self-control of breathing, phonation and articulation, as well as self-control of the resonance that amplifies the sound of the voice. Above all, however, acquiring language and learning to understand and speak requires mental activity, which consists of learning the meaning and attributing it to linguistic signs. Linguistic signs, on the other hand, have a special property - they all (and there are many of them) consist of dozens of sound elements which are produced according to a strictly defined pattern called phoneme. Phonemes can be combined into syllables, which are elements of morphemes and words. Words are linked together according to the rules of syntax and inflection, thus forming sentences.

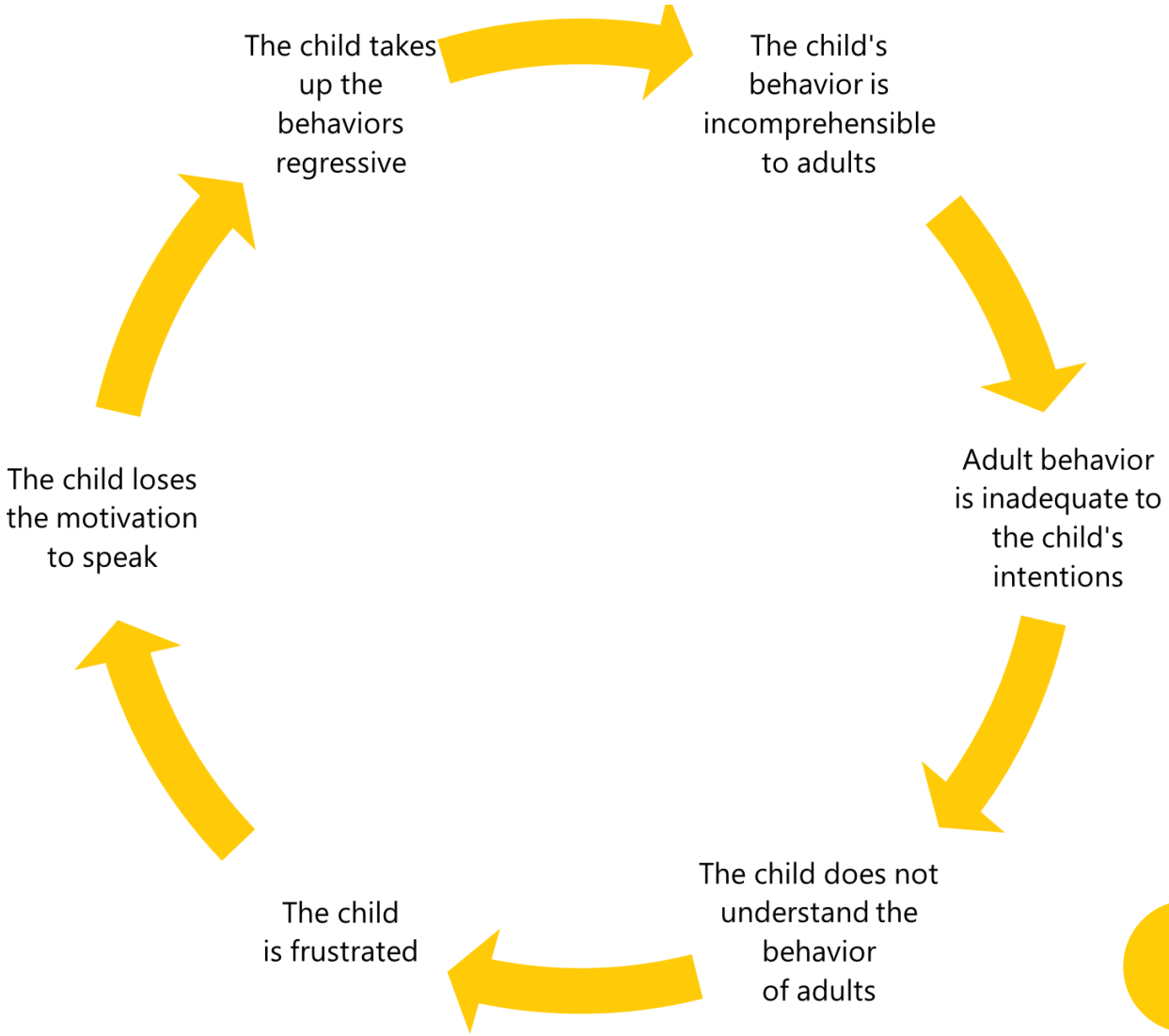
Most importantly, however, language acquisition must take place in a spoken environment, preferably in the family, where the parents and other people close to the child constantly talk to the child, tell him or her about everything that is happening in his or her environment and about everything that is important and interesting to the child.

The acquisition of language therefore consists, on the one hand, of the ability to distinguish and recognize sounds and syllables in a fast flowing stream of speech and to assign meanings to the words and sentences made up of these sounds and syllables. On the other hand it includes learning how to produce a stream of speech made up of sentences which consist of words and these are made up of sounds combined into syllables. The ability to acquire a language is an innate human characteristic, and the child's first language (mother tongue, native language) is acquired, i.e. it is learned in the course of constant interaction between the child and the people around them.

Hearing impairment does not take away a child's ability to learn a language, but it does make the process of language acquisition very difficult. Many children with profound hearing impairment learn to speak and acquire language with great effort, despite the use of well-fitting prostheses (hearing aids or cochlear implants). They have difficulties in distinguishing sounds and syllables and consequently, also in recognizing words and understanding sentences. They hear speech sounds as incomplete and distorted. In this situation language acquisition demands a lot of effort, discipline, regularity, and patience, both on the part of the child and their parents as well as the speech therapist. Moreover, it is important to realize that learning a language in conditions that are not natural leads to a multitude of disorders in language use. In particular, it is not conducive to a full understanding of the meanings of words and sentence structure (cf. fig 1).



Many parents and professionals, especially speech and language therapists, wonder how they can help a child with a profound hearing impairment to learn to speak freely, without too much effort, by talking to the people closest to them during everyday activities, games and walks, while getting to know their immediate and more distant surroundings. How can we ensure that the child does not have to learn each word and each form separately, laboriously practicing the individual sounds, but that the child acquires the language directly from the people closest to them, in a spontaneous (natural) manner, just as hearing children do, in accordance with the dynamics of brain maturation and the stages of development of the child's mind? What can be done so that the rehabilitation of the child is not excessively burdensome and labour-intensive? We are not talking here about an absence of hard work, but rather about the creation of favourable conditions for integral development. It is a well-known fact that language is as necessary for mental development as air, water and food are for life. It is also known that upbringing under conditions of constant coercion has a very negative impact on a child's personality. It often happens that people who were forced to speak in childhood later suffer from logophobia, a neurotic repulsion to speaking (cf. fig 2).

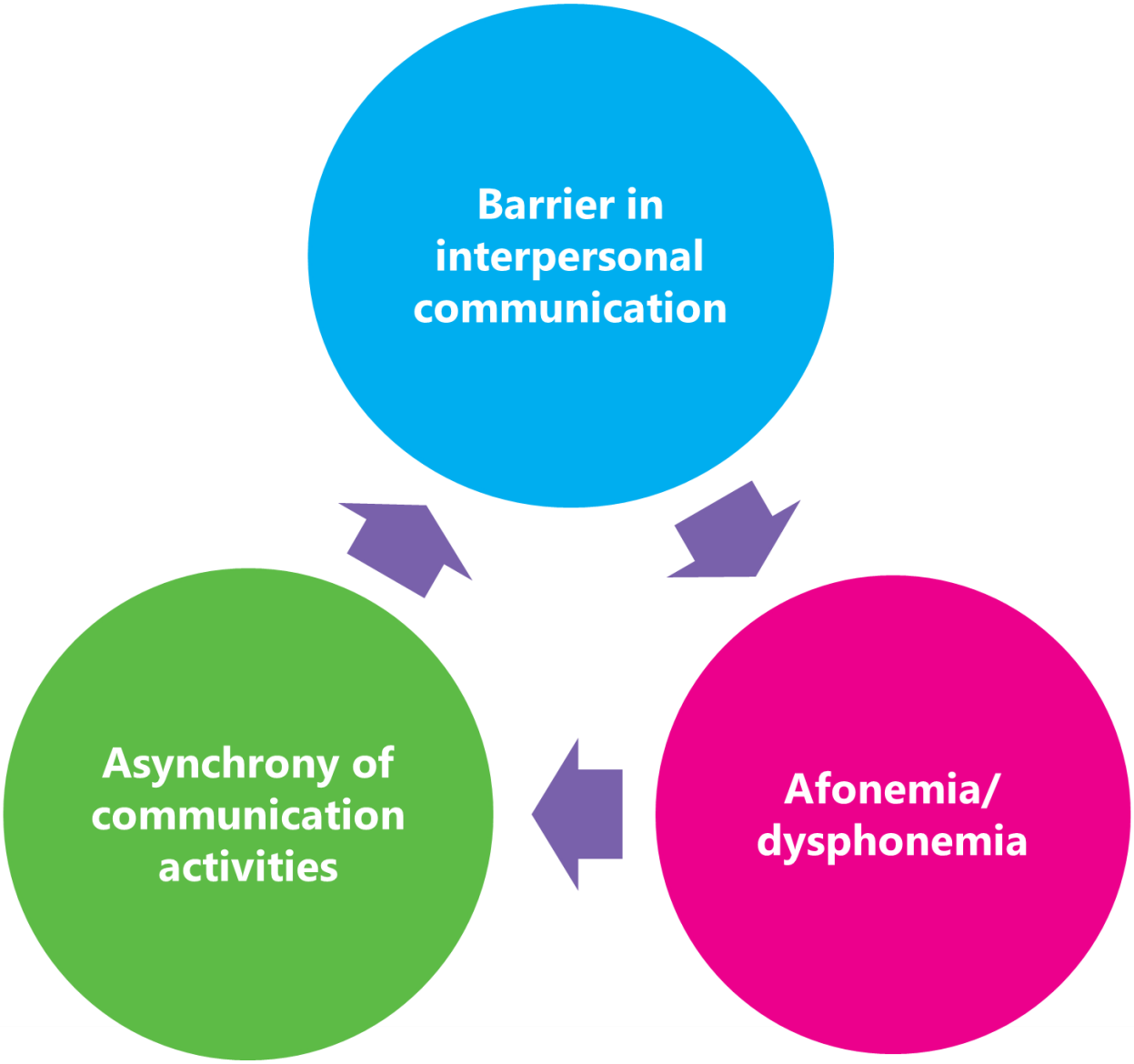


There is no doubt that in order for a child to learn to speak, they must be able to hear as well as possible, and therefore hearing aids or cochlear implants are necessary. Unfortunately, however, a large number of hearing-impaired children do not acquire auditory language on their own, even when given excellent prostheses: hearing aids or cochlear implants and wireless transmission devices. The use of hearing prostheses is necessary but not sufficient.

In order to speak, it is not enough to be able to hear better, but to be able to listen perfectly and to understand words. So why is it often the case that a child with a hearing aid can hear environmental sounds and the human voice, but cannot perceive, understand or remember words? Why is it not possible for them to learn how to listen and recognize words?

The reason for this phenomenon is the inability to distinguish and recognize sounds that have linguistic value - vowels and consonants - that make up syllables, following one another in a fast-flowing stream of speech. Speech sounds (vowels and consonants) appear and function in combination with other speech sounds in syllables that make up words. **In order to learn to speak and acquire language, you need to be able to hear and distinguish perfectly vowels and consonants in syllables.**

Hearing children are born with sensory sensitivity to sounds and a mental capacity for categorial listening that enables them to distinguish the sounds of all human languages. Research has shown that by the fourth day after birth, newborn babies can perfectly distinguish articulated sounds from other sounds and individual sounds from each other. This ability is the basis for the spontaneous development of speech and language acquisition. It enables the child to learn to recognise the sound and understand the meaning of words, and to pronounce them correctly. When learning to pronounce words, the child controls with his or her ears the similarities and differences between their own pronunciation and that of others. They use their motor memory of the movements of speech organs and sense of their position i.e. the sense for the muscular tension of these organs in the articulation of individual sounds. The ability to distinguish between sounds is called phonemic hearing. It allows all words to be distinguished from each other, even those that differ in one very subtle phonemic feature, e.g. rat-bat, bit-hit, leave-live. A complete lack of this ability is called aphonemia, while a deficiency in phonemic hearing is called dysphonemia (fig.3).



A child with hearing impairment has the mental capacity to acquire language. Their brain is ready to recognise and understand words, and their speech organs are ready to speak. However, the hearing organ does not receive enough sensations to distinguish between sounds. This is a barrier to spontaneous speech development .In moderate dysphonia, it is possible to develop visual listening skills called "lip reading", but in the case of the most profound damage to the auditory system, the aid of a prosthesis is often not enough to create sufficient auditory impressions to guarantee accurate recognition of phonemes.

It is therefore necessary to use an additional aid that facilitates phonemes differentiation by using the sense of sight as well as the sense and memory of movement. It is important that this support does not interfere with listening, does not distort speech and facilitates natural brain activity.

It is also important that this support can be used easily in all living situations, at home, in the street, in public places, in kindergarten and at school
Cued Speech can give this support. Cued Speech consists of discrete hand movements that accompany loud and clear speech. These movements have been specially developed to help distinguish and recognise sounds in a fast-flowing stream of speech. Cueing helps the child to overcome dysphonemia and even aphonemia, to acquire language and to learn to speak. Parents and other people can learn to cue within a few days and without much effort and later constantly speak to the child, supplementing speech with cues.

Chapter 2:
The Cued Speech Theory

2.1. A short history of Cued Speech

Cued Speech is a communication system for the deaf and hard of hearing (DHH), elaborated by Dr. R. Orin Cornett in 1966 in the United States. After several years of teaching physics, mathematics and electronics at academic level, Dr. Cornett became the Director of Higher Education at the U.S. Office of Educationwhere he was surprised to learn that DHH students had lower reading skills than their peers.

He had always assumed that deaf people must be proficient readers, as written language was surely more accessible to them than spoken language. His explanation for this lower level of literacy was that the acquisition of language skills began with oracy, not literacy, which posed a consequent difficulty for deaf and hard of hearing children to learn a language in the first place.

Knowing that many DHH children were born into hearing families, the transmission of linguistic and communicational skills proved to be a major challenge for parents of deaf children. Insufficient learning of the spoken language also led to an additional difficulty in lip-reading, which is essential for people with hearing loss.

"A few months of study convinced me that the underlying cause of their reading problem was the lack of any reasonable way to learn spoken language, without which they could not use speech for communication, become good lipreaders, or learn to read"

Dr. R. Orin Cornett

These observations led Dr. Cornett to develop a system to facilitate language acquisition for DHH children by representing sounds visually using both the lips and the hand. He started by establishing the main goal of this system: to render spoken language accessible visually for DHH people, as it already is audibly for hearing people.

His research showed that developing a finger spelling system had already been tried and did not prove efficient due to its complexity and slowness compared to spoken language. His solution was to use “cues”, meaning that he decided to group consonant sounds in 8 hand configurations according to visual contrast and frequency of occurrence. He also grouped vowel sounds in four positions around the lips. Cued Speech is a “phonemic system”, meaning that it is based on phonemes (the smallest units of sound), which leads to a higher level of accuracy and an easier adaptation in other languages. Cornett combined the hand movements with the movements of the lips, which led to better synchronization and a more natural flow.

In order to prove the system’s efficiency, he conducted tests with families with deaf children, starting with the Henegar family in 1966. The parents learnt the system and implemented it with their daughter Leah, who learnt it in a month by simply observing her parents. Her four siblings also learnt how to cue by observation and used the system when talking to their sister. A study conducted in 1982 by Gaye Nicholls for her master’s thesis at McGuill University showed that Cued Speech did not only improve language reception, but that it enhanced both auditory perception and lip-reading abilities of deaf subjects.

After his success, Dr. Cornett started sharing his findings in articles, papers, seminars, and conventions. As people from all around the world were learning about his invention, Cornett realized that other languages would need their own adaptations as well. He developed around 60 adaptations of Cued Speech with the support of native speakers and linguists, following a precisely established methodology. His main goal was for all new adaptation to be as efficient as the American Cued Speech but with a stress on compatibility, thus fostering bilingualism.

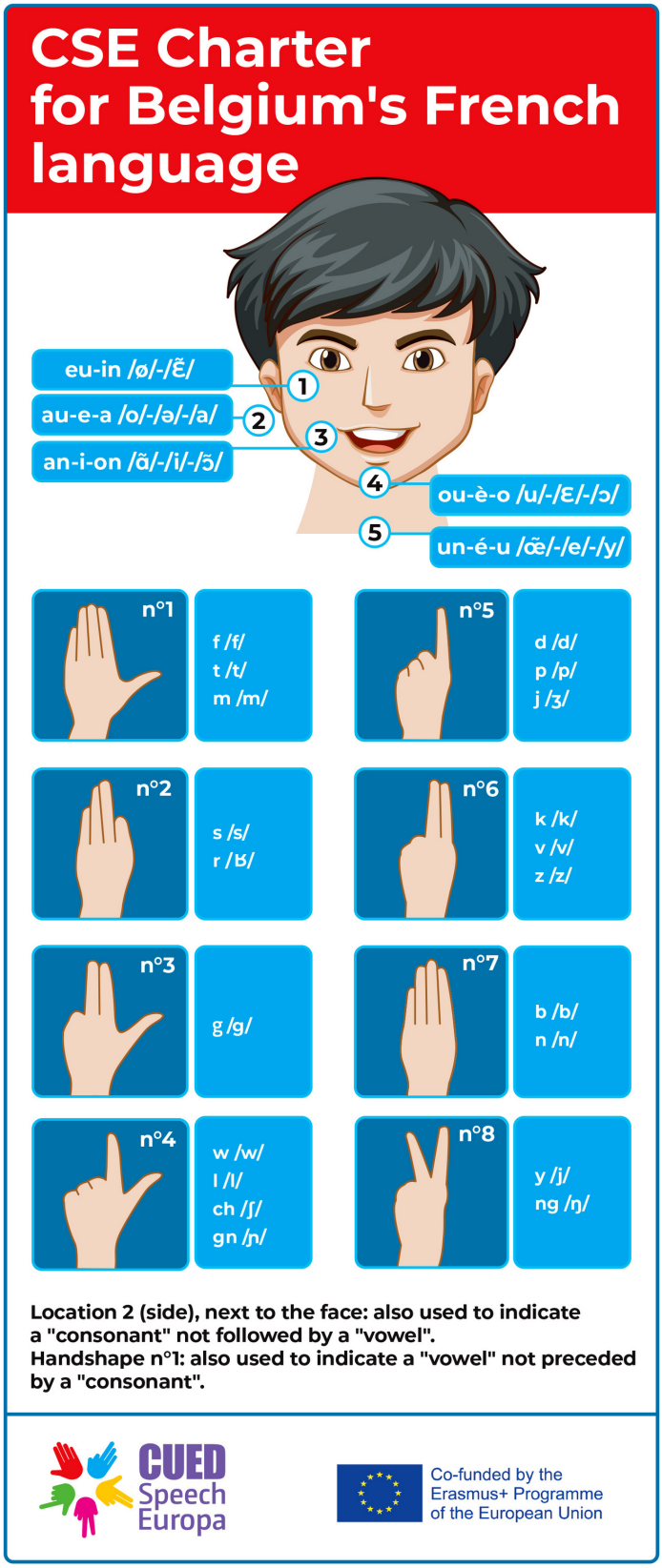
2.2. Cued Speech adaptations to chosen European Languages

2.2.1. French adaptation

“Langue française Parlée Complétée” (LPC or LfPC), see page 12, ALPC Belgium Chart, the French version of Cued Speech (Cornett, 1967) – or French Cued Speech- is a phoneme-based communication system (phonemes are individual sounds of spoken language). It combines visual information from lip-reading (LR) with information from the hand in different positions around the face and provides precise information on the syllables and phonemes of spoken language. This system is made up of a series of handshapes which – combined with the movements of the lips – enable one to identify phonemes just as alphanumeric coordinates make it possible to locate a specific point on a map. In the French language of Belgium, there are 36 phonemes, 17 of which are called consonantic because they represent the consonants of the alphabet. 16 phonemes involve the 6 vowels and 3 are intermediate (semi-consonantic/semi-vocal).

This manual code uses eight handshapes representing the entire range of consonants and demi-consonants in the French language. These handshapes are positioned at five different places on and around the face (1: cheekbone, 2: side, 3: mouth, 4: chin, 5: neck) to make "cues". They are also used to indicate the vowels and their combinations. The hand movements need to be perfectly synchronised with the natural movements of the mouth while speaking, in order to differentiate visually the phonemes of spoken language (lip reading). The “cheekbone” position does not exist in the original version of Cued Speech.

There are no diphthongs in French (Diphthong is a grammatical term, designating two consecutive vowels pronounced together as a single syllable). The system functions along the same lines as for Cued Speech, with syllabic CV units (Consonant-Vowel). The specific rules for vowels with no preceding consonants, and for consonants not followed by a vowel, are the same; the “side” position, used for used for “a” /a/, “e” /oe/ /ə/ and “au” /o/ in French) is also the neutral position for cueing isolated consonants. In French, some identical phonemes are either short or long, but the same location is used to cue them, staying just longer to mark the long phoneme.



The open hand used for cueing /m/, /t/, /f/ is also the neutral handshape used for cueing isolated vowels (with no preceding consonant). This is so except for “h” which in French is a silent letter.

The speaker holds his/her hand close to the mouth while speaking, so that the “listener” can see the movements of both lips and hands simultaneously.

The consonants and vowels have been put into separate groups of two, three or four. Each group has its specific placement around the face (for vowels) or handshape (for consonants).

The system is devised so as to provide a natural complement to lipreading.

Groups of consonants or vowels are allocated to each handshape or hand position so that the elements made up by any specific handshape or placement around the face are totally distinct for lip-reading purposes, and so that elements which are difficult to discriminate on the lips are in different groups.
For example /p/, /b/, /m/ which look alike on the lips are allocated to different (hand)shapes.

What is interesting, Latin lessons can also be cued in LPC or French Cued Speech.

French Cued Speech has slightly different forms in different countries. Since we use the same language, French, the history of French Cued Speech in our three countries is very interdependent.

Switzerland: A short history

1971: Cued Speech was first adapted for French in Switzerland. Denis Mermod, a Pastor in Geneva, and Dr R Orin Cornett adapted Cued Speech to the phonemes of the French language, and initially entitled it “Langage Complété Cornett” (LCC). Its name was subsequently changed to “Langage Parlé Complété” (LPC). When it was presented to an assembly of professionals in deafness in Lausanne in 1973, they decided that the method was unusable as no parent would ever agree to learn and use it.

1982: some parents in French-speaking Switzerland nonetheless showed some interest, learnt it and successfully introduced it in French-speaking Switzerland to help mainstream their deaf children in hearing classes.
1983: The Association pour les Langues Parlées Complétées (ALPC) was set up with the aim of promoting teaching, use and spread of the LPC Cues in Switzerland.

1994: Cued interpretation is recognised for classroom use and funded; training for Cueing Interpreters (C-I) is set up, and deaf children are mainstreamed with LPC support throughout French-speaking Switzerland.

France: A short history

The initiative for its development was taken by the parents of deaf children. From the moment it came to France, LPC use spread all over the country and was widely taken up by families with deaf children, professionals and Centres for the Deaf.

1972: René Dissoubray (INJS Paris - Institut National de Jeunes Sourds de Paris (National Institute for Young Deaf People, Paris) learnt of Cued Speech from an article published in the RNID (Royal National Institute for the Deaf, UK) journal, “Hearing”. He translated it and published it in the Revue générale de l’Enseignement des Déficients Auditifs (General Review of Deaf Education). Mrs June Dixon (UK) read this translation and informed him of the existence of a French version of CS, putting him in touch with Pastor Mermod.

1977: The Jones family who had used CS with their deaf daughter Stasie in the USA, moved to France. They straightway showed interest in the French version which would enable their daughter to follow in a French classroom. Their child's success fired the Spinetta family and others who also adopted this communication with their deaf children.

1980: The Jones and Spinetta families founded the "Association pour la promotion et le développement du Langage Complété Cornett » (Association to promote and develop Cornett's Completed Language)

1983: The name "Langage Complété Cornett" was changed to "Langage Parlé Complété" (LPC - Spoken Language Completed), and then to "Langue française Parlée Complétée" (LPC or LfPC – Spoken French Language Completed). The ALCC then became the ALPC, which is still currently known as the Association nationale pour la Langue française Parlée Complétée (National Association for Spoken French Language Completed). Currently the most commonly used acronyms are LfPC, LPC or LPC Cues, emphasising the fact that this system is entirely based on the French language. A plethora of local associations has sprung up all over France, as well as the "Association nationale des codeurs LfPC" (ANCO) (National Association of LfPC Cuers).

2005: certification of Cueing proficiency became available in Paris and Lyon.

Belgium: A short history

1980: Catherine Hage, the first speech and language therapist (who in Belgian is called logopède, in Switzerland logopédiste, in France orthophoniste) to use LPC Cues in Belgium, attended a Study Weekend in France and brought back to Belgium Mr Dissoubray's cassettes of CS lessons. At the same time, Dr Olivier Périer and his team of speech therapists at the Centre Comprendre et Parler plus the Ecole Intégrée in Brussels (Centre for Understanding and Speaking, and School with Integration) were already on the job and using it too. Its success in practice and the many results obtained from research done in particular by Jesus Alegria and Jacqueline Leybaert at the Cognition, Language and Development Lab (LCLD) of the Université libre de Bruxelles (Free Brussels University), led to others in this field gradually beginning to use it, sometimes along with Signed French or using French Sign Language in parallel.

1984: The Belgian “Langage Parlé Complété Belgique » Association (LPC Belgium) the aims of which are principally the development and promotion of LPC, was born of the alliance between some parents of deaf children and professionals working in the field of deafness. Initially it was considered as the “little sister” of ALPC France. Subsequently it took the name “Association pour la Langue française Parlée Complétée Belgique” (ALPC Belgium).
There are no associations for the other Belgian languages (German and Dutch) even though the adaptation of Cued Speech for the Dutch language (VISI-C) and Cued Speech itself are used to facilitate multi-lingual access (but are little used, just like EdLS, for german language, in Switzerland). ALPC Belgium also delivers courses in Visi-C or Cued Speech.

The system of cues used in Belgium to cue the French language is identical to that used in France and Switzerland, with the exception of a demi-consonant which the great majority of Belgians do not pronounce the same way as the French and the Swiss.

In Belgium, no distinction is made between sounds [w] /w/ and [ui] /ɥ/. Belgians pronounce the word "joint" [w] /w/ in the same way as "Juin" [ui] /ɥ/. They pronounce the word "huit" with the key [w] /w/, while the French and Swiss pronounce it with the key [ui] /ɥ/, according to their own pronunciation.

Cues sometimes vary from one region to another in the French-speaking region of the country, due to the variety of different accents that can be found. In Belgium, an LPC cuer can be called a “codeur or codeuse”, or a “translittérateur or translittératrice” (transliterator).

Brigitte Charlier (founding member of the Belgian LPC Association), Director of the Centre Comprendre et Parler of Brussels, mentioned in 2016, at the 50th Anniversary Celebration of CS in Washington (USA)… that Belgium is a country where the use of many languages is common. So there is less "rivalry" with sign language, which is just one more language. She also indicated that the very close links with the research laboratory of the ULB (Université Libre de Bruxelles) mean that research is exceptionally well supported there.

2.2.2. Italian adaptation

The Italian Cued Speech P.I.T.A. (Parola Italiana Totalmente Accessible - Italian Totally Accessible Word) was adapted by Dr. R. Orin Cornet with the collaboration of Lucio Rossi. The Cued Speech is used mainly for languages with higher lip-reading ambiguities (such as Anglophone or Francophone languages – Massoni, Marogna, 2004).

This is not the case of the Italian language, which is why the literature on the Italian adaptation is minimal. Nevertheless, since the '60s, Italian experts have been developing approaches and methods using gestures and hand positions to facilitate the comprehension and oral speech of deaf people.

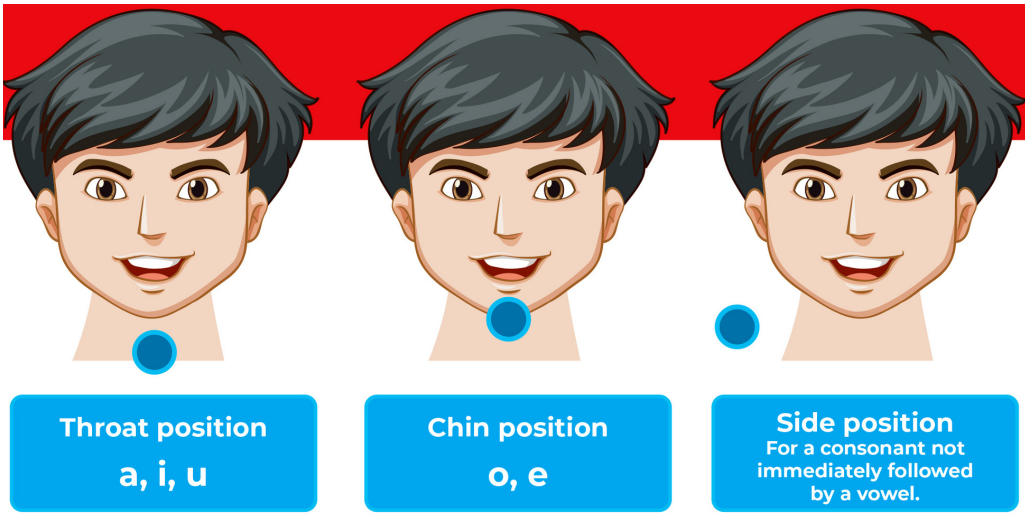
These methods have been implemented and developed mostly in clinical, educational, and academic fields. In addition to fingerspelling or dactylology, the Verbotonal Method by Petar Guberina (Director of the Phonetic Laboratory of the Zagreb University), connected methods such as the phonetic transcription by Aldo V. Gladic and the Creative Stimulating Rehabilitation Method by Zora Drezancich, are the most relevant.

The Italian Cued Speech adaptation or P.I.T.A. has seven configurations for consonants, two hand locations for vowels, and another hand's location to specify when a vowel does not follow a consonant immediately.
The two locations of the hand identify two groups of vowels sounds: one for the vowels /a/, /i/, /u/ (throat placement), and one for the vowels /o/, /e/ (chin placement).

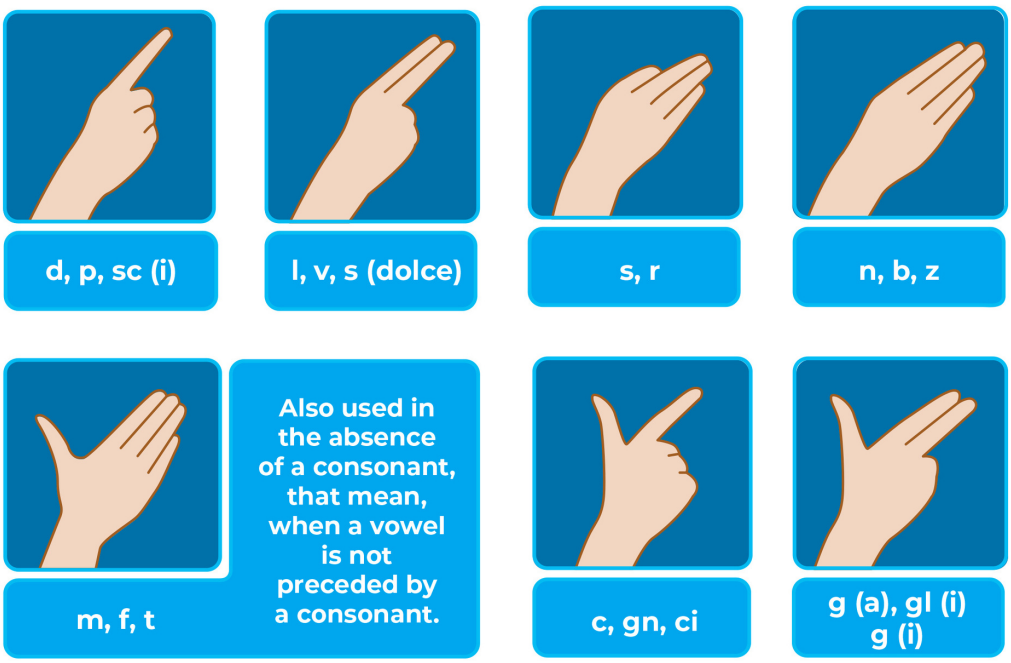
The two placements stress the difference between phonemes more difficult to discriminate through lip-reading (/o/ and /u/; /a/ and /e/; /i/ and /e/) that could confuse a deaf person.

Even if the oral Italian language has seven vowels (/è/ half-open, /é/ half-closed, /ò/ half-open /ó/ half-closed, /a/, /i/, /u/), it is not relevant to make a difference between half-open and half-closed. This distinction does not affect comprehension.

Please find below tables with the placements and configurations of P.I.T.A. for vowels, sounds and syllables groups for each configuration.



As you can see, each configuration (handshape and placement) identifies more groups of syllables.



P.I.T.A. aims to facilitate the comprehension of oral language with the support of visual information. It requires an adequate level of cognitive, executive (e.g. working memory) and praxis functions to be learnt and implemented. Some research underlines the role of P.I.T.A. in the process of learning reading and writing and reinforcing the auditory perception skills of similar phonemes, especially to build a phonological lexicon and to start with the "read-write". (Marogna 2006/2007; Santinello 2016/2017).

If we refer to the official charts produced for the Italian Cued Speech adaptation, we can observe that hand positions for vowels are the same and there is a list of handshapes for consonants.

2.2.3. Polish adaptation

Pure sign language communication or pure oral communication were regarded in Poland as insufficient for the integral development of deaf and hard of hearing children's communication skills. New methods have been looked for, It was 200 years ago when Jan Siestrzyński developed "hand and mouth signs" - a system of gestures that aimed at supporting speech recognition. However, this system - due to different political circumstances - was not developed into regular method.

The Polish version of the Cued Speech (called fonogesty) was developed in 1986 by Professor Kazimiera Krakowiak. It is based on the original American Cued Speech as developed by R.O. Cornett and its French version - Langage Parlé Complété (LPC).

The Polish Cued Speech (fonogesty) closely corresponds to the phonetic system of the Polish language. The author of the adaptation took into account all the basic sounds (phonemes), i.e. sound elements which have to be recognized (in order to perceive and understand Polish speech) and pronounced (in order to speak intelligibly in Polish).

The set of basic Polish phonemes include 8 vowels and 35 consonants. The Polish Cued Speech system consists of the so-called locations, i.e. the points near the mouth that the hand shows when pronouncing vowels (see Figure 1) and the hand shapes used when pronouncing consonants (see Figure 2). There are four hand locations corresponding to vowels and one location where we make gestures that accompany consonants followed by no vowels.

There are eight basic hand shapes for consonants (see Figure 2). These correspond to the hard consonants. Soft and softened consonants, on the other hand, correspond to variations of the basic hand shape, which are made by slightly bending the fingers towards the inside of the hand. If there is no consonant before a vowel, the hand adopts a pattern with all fingers are curled slightly into a fist (see Figure 3). The individual hand movements accompany the articulatory parts of the syllables without disturbing the rhythm and melody of speech.

When we cue, the hand adopts a hand shape for a consonant and at the same time moves towards the vowel position that follows the consonant (it moves towards a certain point). If there is no vowel after a consonant, the hand points to location 5 (see Figure 1).
With these movements one can simultaneously speak fluently and melodically with correct intonation, stressing syllables and accenting words and following all the rules of speech culture. The pace of speech can be natural, appropriately slowed down and adapted to the child's perception. In this way, the child receives the correct articulatory and rhythmic patterns and also - to the best of their ability - partial auditory patterns.

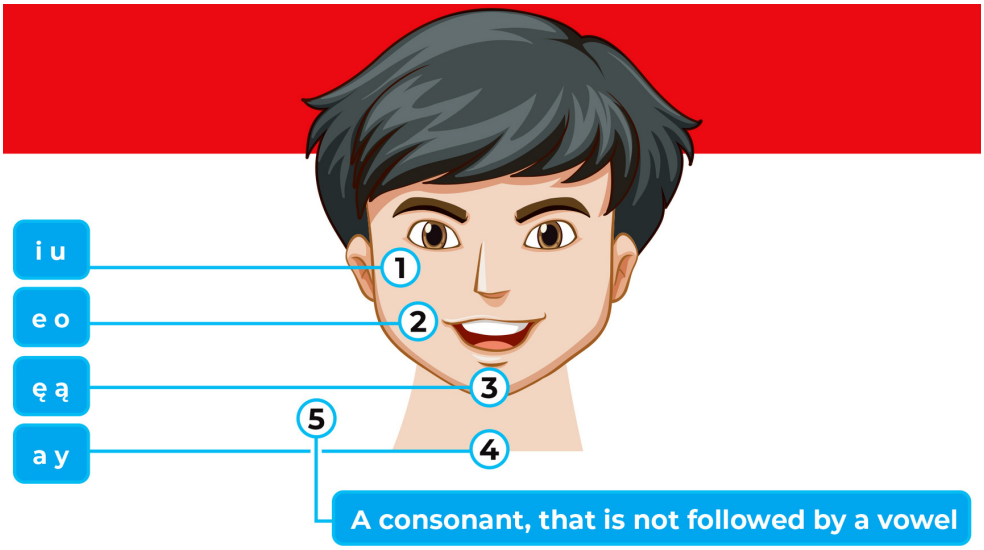


Figure 1. Hand locations for vowels.

Figure 2. Hand shape for a vowel with no consonant before it.

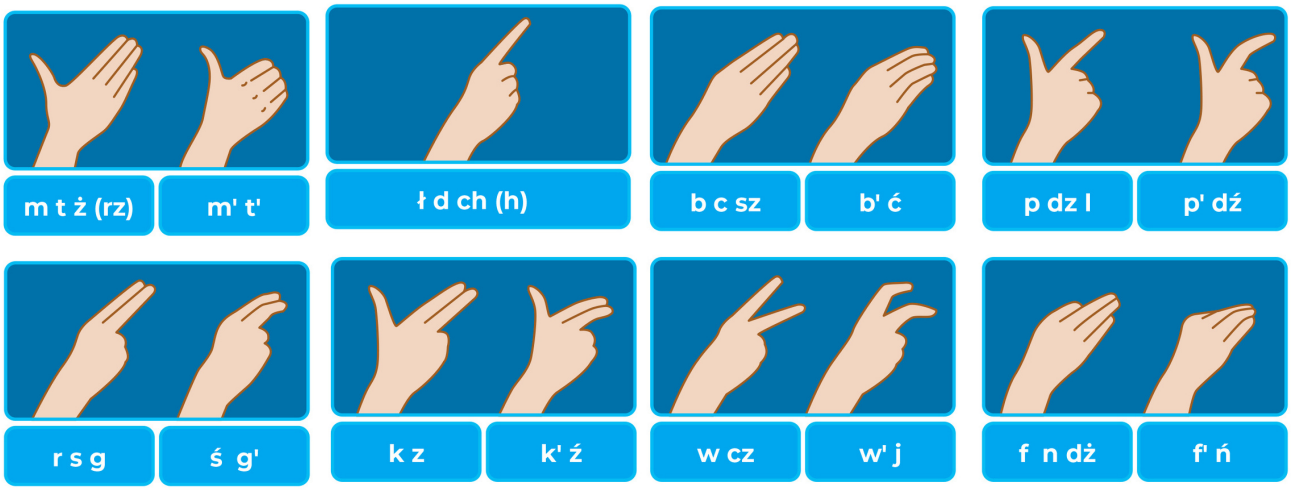


Figure 3. Hand shapes for consonants.

Polish experience clearly shows that the ability to "hear visually" depends on the degree of mastery of linguistic patterns, on the formation of precise internal representations of words (word images in one's mind). Cued Speech facilitates accurate visual-auditory perception and categorical segmentation of the stream of speech signals, i.e. its division into elements having specific meaning and formal and grammatical functions. In this way they enable the formation in the child's mind of stable phonemic patterns, isomorphic to auditory patterns (Krakowiak 1998, p. 256).

The most important advantage of the Cued Speech method is its full compatibility with the natural acquisition of language by the child and excellent interaction with hearing prostheses (hearing aids and cochlear implants).

The system of supportive gestures contains a detailed programme of auditory-language education, which enables the child with hearing impairment to acquire the full morphological system of language. On its foundation, the child can develop a lexical and semantic, syntactic and flexible system in a way that is consistent with the natural process of language acquisition.

The effectiveness of the Cued Speech method in teaching Polish was examined during a pedagogical experiment conducted in educational centers for deaf and hard of hearing children. A detailed description of the experiment can be found in the book by Kazimiera Krakowiak (1995): "Cued Speech as a tool of language formation for children with impaired hearing".

2.3. Cued Speech and other methods of communication with DHH persons

The possession of language is a unique resource of the human being. Among all living animals only man is endowed with full language, in both oral and signed modality, a crucial evolutionary development that gives us a full, conscious existence in the world. Deafness challenges the typical acquisition of language, based on a phonocentric idea of human communication. Since the beginning, educational methods for the deaf have tried to re-establish effective communication, even if the tools to achieve it have been very different over time. The biggest swing has been about whether to use signs or not. And so, the main methods for the education of the deaf can be divided precisely from this distinction.

2.3.1. Oral Language

Oral methods in the education of the deaf have as their objective the restoration of orality in children with severe hearing impairment, who due to this deficit are not exposed to the historical-oral language of the country in which they live.

The education of the deaf began precisely with this objective, when in the Renaissance period Spanish monks attempted the education of young princes from various parts of Europe. But the golden period of the oral method was the one following the Milan Congress in 1880, when it was decided to exclude sign language from the education of the deaf. The belief was that Sign Language could slow down or prevent the development of orality. A method of oral teaching was developed, of articulation of the single phonemes of the language through pronunciation exercises and a work on language carried out in special schools for the deaf by specialized teachers, who had at the same time the functions that are today of two different professional figures, teachers and speech therapists.

During the twentieth century various methods tried to support orality, some also through music, such as the methods devised by Aldo Vinco Gladic (phonetic graphism) or the Phonetic-Rhythmic method of Zora Drezancic.

At the end of the 1900s and in contemporary time, oral education of the deaf child was further developed with the advent of the cochlear implant. This device has revolutionized the education of the deaf, having as its objective the restoration of hearing and consequently linguistic functionality. New methods have been developed to support the cochlear implant. The best known is the Auditory Verbal Therapy method, which among its requirements provides for maximum use of hearing and strong family involvement.

2.3.2. Sign Language

Since ancient times we know about deaf people communicating with each other using "gestures" and, even nowadays, in all countries where there is a Deaf community, there is also a form of communication of this type. In each country you will find a different sign language and sometimes also more than one, with their own phonology, vocabulary, syntax and semantic, which vary significantly from the national languages.

Since the beginning of the education of the deaf at the end of eighteen century, until 1880 sign language was widely used in institutions for the deaf, in which even many Deaf people were working as teachers. In 1880, in Milan, an international conference was held to decide the kind of education that shall be given to deaf pupils and since then, the sign languages were banned from teaching and repressed in many ways. It has been only from the 50s and the 60's of the XX century that research on sign language started and led the international scientific community to the rediscovery of linguistic character of visual-gestural languages used by deaf people.

One of the most famous researchers in this field is William Stokoe, who decided to study sign language by adopting the same linguistic criteria normally used to investigate the languages used in small communities, with the intent to understand whether this is a form of pantomime or a language in its own right. His work marks the beginning of the reflection of contemporary linguistics and semiotics on sign languages. Analyzing American Sign Language (ASL) Stokoe discovered a structure in many ways similar to that of verbal languages: as the combination of a limited number of sounds without meaning (phonemes) creates a vast number of units with meaning (words), so the combination of a limited number of minimum units can produce a wide number of units with meaning (the signs).

From a phonological point of view, according to the analysis given by him, a sign can be decomposed in reference to three parameters:

1. The place in space where the hands are running the sign;
2. The configuration of the hands performing the sign;
3. The movement in performance of the sign.

Later than the original analysis of Willian Stokoe, at least three more other important parameter have been identified from research on Sign Languages, using the method of the recognition of the minimal pair of signs, changing for one only parameter.

4. the orientation of the palms of the hand;
5. the facial expressions;
6. the oral components – or mouthing (those vocalizations, often partial and not necessarily consistent with the verbalization of the word, which may accompany the production of a sign).

Mouthing can be of two types:

a. Images of Borrowed Words (IBW): comparable to oral language, mouthed at the same time of the articulation of sign. The lips utter the corresponding word in the language, even if it can be complete or partial and is not inflected according to gender and number. The IBW can be used to bridge a gap using mouthing when sign language is missing or in excess of local variants, in order to disambiguate the message content.

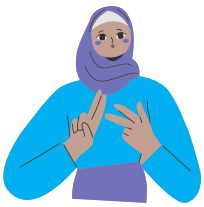
b. Special Oral Components: it consists of oral expressions accompanying the sign, such as sounds, noises, puffs, swelling of the cheeks, buccal expressions, not always clearly connected with the oral word.

Even if mouthing is considered as a parameter, because it is possible to find couple of signs in minimal pair only for the mouthing, it is a matter of discussion what is their real linguistic nature, because it is also easy to define them in the framework of inter-linguistic contact phenomena.

The methods using sign language in the education are called bilingual. Bilingualism involves exposing the deaf child to both the oral / written language of the country of birth and the local sign language. Sign Language and Cued Speech are, of course, very different. Sometimes they are used for the education also of bilingual children, who can use the two forms very fluently. However, Sign Language has to be seen in the framework of minority languages, while Cued Speech in the one of the accommodations of the communication of the deaf.

2.3.3. Mixed Methods

There are also mixed methods, which involve the use of both languages, oral and signed and are called bimodal. Sometimes mixed methods are also called "total communication" because they try to use any useful tool to allow effective deaf children, including oral words, signs and gestures. Total communication is different from biligualism, where two languages (oral and signed) are used.



The bimodal method combines the use of a sign language and a spoken language, also addressed the need to make oral comprehension more efficient. With this approach, the children learn to associate the meaning of the sign to the lip-reading. Normally the grammar and the general structure of the sentence remain that of the oral language, while the lexical apparatus is that of the sign language, which is always accompanied by lipreading and mouthing.

The final product, which makes the spoken language visible, is called differently in various countries: Italiano Segnato in Italy, Signed English in USA and UK, Français Signé in French, system językowo-migowy in Poland.

There is also an additional version of these spoken languages translated word by word, which allows you to view and translate words that do not exist in sign languages, such as articles and clauses, using the manual alphabet. This system is called Signed Exact English, a manual communication that strives to be a very exact representation of English vocabulary and grammar. This system is called Italiano Segnato Esatto in Italy.

Mixed method might also mean using Cued Speech and signs together. In Belgium, since 1992, the Center Comprendre et Parler and the associated Ecole Intégrée of Brussels have developed an original combination of Cued Speech and signs called Complete Signed and Cued French (CSCF) which can be considered as a steppingstone to French Cued Speech.

"The FCSC, Français Complet Signé et Codé, consists of using the LfPC in all interactions with the child, while punctuating it with signs, borrowed from the lexicon of Sign Language. The objective is to move as quickly as possible to LfPC alone, which guarantees visual access to all the components of French".

Chapter 3:
Advantages of using Cued Speech

3.1. Advantages of using Cued Speech for DHH persons

No deaf and hard-of-hearing people, whether adults or children, have total access to spoken language – whatever their degree of deafness or effectiveness of their hearing aids. Nicholls and Ling observed back in 1982 that lip-reading was not enough to allow someone with a hearing impairment to understand spoken language. It is worth to mention that Gaye H.Nicholls worked in the St Gabriel school for the deaf near Sydney in Australia, where she used CS to teach deaf children. Cued Speech (CS) combined with lip-reading makes it possible to differentiate between lip similarities (words that are indistinguishable on the lips), thereby removing the ambiguities that arise from identical or invisible sounds. The use of CS improves the perception of the spoken word and fosters the process of developing receptive and expressive language without having to hear it. CS facilitates oral communication and provides access for a child needing to develop language, to a complete and structured linguistic model.
The following citation can be an illustration here:

> **"She sees exactly what is said, she "hears" through her eyes, that is what many pieces of research on the subject have demonstrated" (Cornett, 1967; Alegria, 1992; Leybaert et al 1998; Périer et al 1988)**

It would seem reasonable to think that the slight slowing down and better articulation that come with using Cues help in increasing comprehension. The use of CS with hearing-impaired children promotes their inclusion/integration and autonomy in every context: the family, school, social, professional and as citizens. Both deaf and hard-of-hearing people can use it to communicate with each other and as a way to perceive spoken language when interacting with hearing people. It is simple, efficient, and quick for anyone to learn: ten hours of training are enough to acquire the basics of this system.

As mentioned by some authors in the field, “LPC is currently the only manual system that has been shown to provide complete real-time visual perception of speech ” (Cornett, 1967; Alegria et al., 1992; Leybaert et al., 1998; Périer et al., 1988).

With CS, one no longer needs to simplify what one is saying. At a later stage, that mental agility which is so necessary to understand people who are not Cueing, will have been developed through the sheer level of language proficiency achieved.

Dr R.O. Cornett, the inventor of CS, wrote in 1988, **“Lip-reading is a competence which cannot be developed to a useful level until one is familiar with that spoken language. It is of no use for learning that language.”** Ling and Clarke, who carried out one of the first studies on lip-reading ability with CS, said so back in 1975, and in 1976 said “Cued Speech works!”, and “The advantages increase the more one is exposed to it”. Other professionals in the field of deafness have also said that “CS enhanced use of hearing and did not distract auditory attention in deaf children” (Charlier & Paulissen, 1986).

Deaf or hearing, we all use lip-reading. The extra advantage of those who use Cued Speech is that they generally become better lip-readers. **Research results confirm that:** […]“the results with deaf children who have had the benefit of CS from an early age – and to a lesser extent those who have been exposed to it later and solely at school – show that CS reduces the ambiguities of lip-reading” (Leybaert et al., 2011).

“Young adults from Cued Speech backgrounds demonstrated phonological awareness skills and reading comprehension similar to hearing peers and superior to those from non-Cued Speech backgrounds” (LaSasso & Crain & Leybaert, 2003).

3.1.1. Cued Speech and Literacy

By using Cued Speech consistently, even deaf or hard-of-hearing children who do not have Cochlear Implants can attain age-appropriate levels in linguistic competence and literacy which allow them to increase their reading levels considerably, and thereby vocabulary too. In addition, these Cues build a phonological grid. This has been affirmed by many authors, including Leybaert & Lasasso, 2010.

It is worth to remind that Jacqueline Leybaert is a doctor in Psychology and Education, Professor in Free University of Brussels (ULB), member of the Cognition, Language and Development Lab, author of numerous scientific publications on the linguistic learning processes of deaf children and Carol LaSasso, is Professor in the Department of Auditory Sciences, Speech and Language at Gallaudet University in Washington DC. They have pointed out that it is an "**aid for memorising new words**" (Alegria & Aurouer & Hage, 1997), that "**the use of Cued Speech improves development in writing**" (Leybaert, 2000), that it "**encourages, facilitates access to reading**" (Alegria & Dejean & Capouillez & Leybaert, 1990) and that it "**fosters lexical development**" (Hage, 1994). As research confirms, "[…]it has been shown that CS, used early in the child's family environment, provides considerable help in speech perception." (Périer et al., 1988; Alegria & Charlier & Mattys).

For a deaf child, CS develops an internal model of spoken language which can initiate the process of learning to read. With CS, one can use a variety of expressions to convey any single idea and unlock the implicit, thus progressively enriching vocabulary and sentence structure.

One can cue any sound, proper nouns, onomatopoeia, unknown and technical words that may exist in the language being spoken.

Literacy is very important in order to be able to learn independently, because access to written language is absolutely crucial – most information being available in written form.

3.1.2. Language learning at home, through speech and language therapy, and at school

Deaf or hard-of-hearing children are for the most part born in hearing families. 95% of their parents are in fact people with normal hearing and their mother tongue is therefore a spoken language. CS can be used with children of any age – including babies and infants – and enables parents to communicate fully with their children. One of the main criteria for the inventor of CS was that "**this system must be able to be learnt by hearing parents of average intelligence who are willing to make a reasonable effort to help their child**". The children learn from their parents: "The deaf child learns to read CS as a natural process, through impregnation" (Cornett, 1967).

"**Children who are exposed to cues at home perform better than others when it comes to discerning rhyme and in reading results**" (Leybaert & Charlier, 1996). This is so because "In a speech and language therapy context, CS guarantees visual access to all aspects of the (French) language – both phonological and morphosyntactic" (Croiseaux, 2020).

This system must also be able to be learnt by a very young child who has a hearing impairment through language immersion at home (Linguistic immersion: the normal process of being regularly exposed to spoken language) Parents who cue while speaking aloud at home, are keeping up the auditory stimulation that will be worked on in auditory rehabilitation sessions during speech and language periods. They will also expose the child to the accents, dialects, rhymes, comic turns of phrases or even nonsense that occur in natural family conversations.

Ideally, the child should be able to benefit from **daily exposure** to full spoken language in all its richness and variety, from the very **earliest age**, and intensively so in **all contexts** of its day-to-day life. All those close to such a child are capable of learning and using CS in any interaction in daily life – whether communicating, speaking, singing, playing reading a story etc – thus enabling that child to develop linguistic skills in a natural manner during the period when it is open to acquiring language.

That having been said, CS can be used to help children even when it is not being used all the time. In school, the teachers can use CS themselves or allow a Cueing interpreter or transliterator alongside them in class, both in a special educational setting and in mainstream school.

What is interesting, as Cued Speech is a system adapted to many languages, it can be used for **learning foreign languages**: "All versions are compatible with each other, so that a deaf child exposed to LPC or CS can then readily go on to benefit from the system when learning any number of other spoken languages." (Charlier, 2020). Anna Podlewska writes more about the practice of teaching English as a foreign language to deaf and hard of hearing Polish students (Podlewska 2013, 2014, 2015).

3.1.3. Cued Speech and Bilingualism

Cued Speech has been adapted for **over 60 major languages and dialects** and can therefore be used to support the learning of foreign languages. Cues are not based on spelling. They show how a phoneme sounds and the system can therefore be used to correct pronunciation.

CS can be used as a complement to Sign Language (SL) in families that choose a bilingual approach, that is "spoken language of the country + CS" and "SL" for their child. "Spanish was taught in the "Model Secondary School for the Deaf" entirely as a spoken language with Cued Speech, and it was observed that the deaf students often spoke better Spanish than English (because they were exposed to spoken models of correct Spanish pronunciation from the beginning,whereas throughout the rest of their lives, their models for pronunciation of English had been without Cued Speech and so, often imprecise." (Daisey, 2005)

3.1.4. Cued Speech and Cochlear Implants (CI)

"Deaf children with an implant are really 'deaf children who can hear' but not 'hearing children'. Implants do not currently restore perfect hearing." (Leybaert et al., 2011) CS complements the use of hearing aids and implants effectively, clarifying each sound, in real time, as and when it is uttered: "**Children's use of CS prior to cochlear implantation has a significant positive effect on ability to benefit from the implant**" (Osberger, 1997).

It backs up the perception of the message and spells out visually what is being picked up aurally in noisy environments. "[...] as with children who heard normally before becoming deaf, children exposed intensively to CS during the pre-implant period and over the two years following their implantation, got genuine benefit from their cochlear aid" (Leybaert et al., 2011).

Deaf individuals with Implants complain of finding it difficult to understand well in situations with a lot of background noise. **The use of CS means communication can continue even when the deaf or hard-of-hearing person is not wearing their CI or when there is background noise**, which is very often the case in everyday life. Cueing does not interfere with auditory processing – on the contrary, it reinforces the message as it comes across.

According to studies published in 2010, CS enhances the perception of the spoken word, lip-reading skills and language base of children with a Cochlear Implant(s): When audio-visual speech is presented, children with CI rely more on visual information (lip reading) than hearing" (Schorr et al., 2005; Rouger et al., 2007).

CS can be used **before implantation to establish the foundations of language** and **afterwards, as a supplement**, until the Implant is fully working, and as a fall-back in noise or when the Implant is not being used or is not working correctly. "CS effectively enhances perception of the spoken word and development of early language for children with a Cochlear Implant." (Leybaert & LaSasso, 2010). Publications such as that of Santiago Torres (Professor of Fundamental Psychology in the Psychology Faculty of the UMA up till 2013, devoted his professional life to improving the traditionally poor reading levels of deaf people. (Torres et al. 2008), indicate that Implanted children can attain a level of reading comprehension similar to that of normally hearing children. CS and Cochlear Implants are perfect partners!

3.2. Cued Speech in inclusive education

Positive and integral development of deaf and hard of hearing students is nowadays the main goal of education and developmental support. It means that care is taken not only for the child's medical and rehabilitation needs, but also for their social and emotional well-being. In the present era of inclusive education and inclusive practices of local communities and society in general, each person – despite their disability or medical conditions – has a full human right to develop, learn and enjoy everyday life in their natural social environment, composed of family, neighborhood, local school or institution that serves best other people of their age. **Inclusive education, understood as a good quality education for every student, includes using new methods and strategies to support mutual communication and understanding**.

Cued Speech can serve as a useful tool of inclusion. If used by teachers and both hearing and hearing-impaired children, it creates a communication community, where everybody is using the same national language, and these students, who need speech visualization to understand speech and learn it – have this opportunity through cues used by their teachers and peers. Cues accompany clear speech so their use do not disturb hearing children, but immensely promote speech understanding and language acquisition of deaf and hard of hearing students.

Inclusion of deaf and hard of hearing children may be organized in different ways: as a full immersion of a deaf or hard of hearing child in a hearing class or as creating a special unit for hearing impaired students within a mainstream institution. It should be also mentioned that in many countries special school and institutions for deaf and hard of hearing student have been still offering education for some groups of children and adolescents. A key decision of the best possible communication method and model of education for a given child should be taken in cooperation of professionals (teachers, speech therapists, psychologists), the child's parents, and the child themselves. The next step is to care for preparing the institution for the child which means first off to create a communication community where a child can enjoy meaningful social relationships with both his teachers and peers.

The best results can be achieved if Cued Speech is introduced early, as a natural element of the child's play and early verbal and non-verbal exchanges with other people. When the child experiences Cued Speech at home, during the early intervention classes and in the nursery, they can easily develop their phonemic hearing and acquire language necessary for developing reading and writing skills. Such children usually acquire the functional school skills in an age typical for their peers and can learn successfully in inclusive settings. **Cued Speech can be a tool of inclusive communication at any stage of education**. In order to achieve it, Cued Speech elementary courses should be offered in the teacher training programs and study programs for other professionals (speech therapists, early intervention specialists, special educators). Thus, they will be prepared to offer their teaching and other services with the support of Cued Speech if a child using Cued Speech joins their institution.

The next important step in creating an inclusive cueing community is to prepare the inclusive institution for the cuing students after a decision of their enrollment has been taken. It may include organizing special courses for teachers, educational professionals and non-pedagogical staff who can learn the basics of Cued Speech and later on practice it while working with the child in class or in groups where the child is present (e.g. during extra-curricular activities). **The basic Cued Speech course takes several hours to complete and it can be an important element of Continual Professional Development**.

It is also necessary to create a cueing peer community. Basic cueing courses should thus be offered to the deaf or hard of hearing child's peers. Children usually are very interested to learn this new way of communication and are motivated to learn cues and use them throughout the school activities. National Cued Speech associations can support schools in professional organization of such courses.

When the cueing child joins the school, a strong and continual support should be offered both to the child, their peers and all school staff to continue the cueing support. This might be the specific role of a supportive teacher/special educator or teacher assistant, but the whole school community should feel responsible for this. However, if there are teachers who do not cue during their classes, the supportive teacher might serve as an assistant teacher - transliterator (cueing support), transmitting the teacher's and peers' words with cues so that the child can understand them.

Cueing children quite often seem to understand the spoken language quite well and it makes their teachers and peers stop using the cues prematurely. However, it is necessary to remember that child's language competences should grow all the time and this involves learning constantly new vocabulary and language structures. If this process is not supported by Cued Speech, the new language elements might not be recognized properly and as a consequence, the student might not be using the new words or structures correctly. For a cueing child to understand their peers' talk and participate actively in peer conversations is also crucial to feel included in the peer relationships. If the peer conversations are cued, it enables the deaf or hard of hearing child to get access to a specific peer language and culture.

3.3. Cued Speech in other target groups

Cued Speech has been originally devised to support children with hearing loss in understanding better speech and in consequence - acquiring a good level of literacy. However, as the experience shows, it can be also used in supporting **hearing children with speech and language disorders**– all these who could benefit from receiving auditory information visually, like people with **Autism Spectrum Disorder (ASD), aphasia, dyslexia, Central Auditory Processing Disorder (CAPD) or Specific Language Impairment (SLI)**.

For children with speech and language disorders, speech sounds are very confusing, and CS might help them to distinguish speech sound out of a stream of speech which seems to them to be nothing but a jumble of noise. Thanks to cues, they start to be able to perceive consonants and vowels that build words and sentences and this make sense of the everyday speech and provides a **model for spoken language to be copied**.

As Ann Clarke writes, CS can be used, e.g. by speech therapists or parents for several purposes: **improvement of sound discrimination** (e.g. identifying minimal pairs, rhyming words or distinguishing voiced/voiceless sounds), **identifying omitted sounds, sequencing sounds and syllables**, teaching the competences of **sound segmentation and blending in words** and also **word analysis and synthesis**. CS is also very useful while **clarifying pronunciation of new vocabulary**. This last quality may be helpful in both native language and foreign language classes. The CS potential makes it a great tool for exercising fine language skills, like **mastering prosody, word and sentence stress, fluency, and rate of speech**.

CS might be also recommended for **children with hypersensitivity to sounds**, as it sometimes happens in e.g. the Autism Spectrum Disorder (ADD). Their teachers and therapists can use speech with visual cues – but without voice. The children are offered then the same phonemic message as if they were listening to it and the phonological base is being developed for them to read and write, and in general – communicate.

As Beck noted, there are some experiences of using CS with children who experienced different kinds of brain damage and lost the ability to process the auditory stimuli.

CS might be a tool to restore their language competences: it makes the children concentrate on the speaker's face, gives them a multisensory stimuli and makes it possible to lengthen or shorten phonemes so as to support their understanding by the child.

CS appeared to be very much adaptable for the needs of these persons. It can be used individually or in groups of children, either on everyday basis – or selectively, when only some more difficult words are cued. CS may work as a teaching tool, self-monitoring system or a means to correct mistakes.

It is important to remember that CS is a motor system and **it might be more difficult for children with poor motor coordination, motor memory and/or dyspraxia to cue while speaking**. However, even in these cases children may benefit a lot from seeing their teachers, parents or therapists using cues while speaking to them.

Chapter 4:
Good Practices and Case Studies

Several case studies have been conducted since Cornett's first experiment with the Henegar family, first in the U.S. and later on in the countries where the Cued Speech adaptations have been developed. These studies have demonstrated some good practices in the use of Cued Speech that we will summarize in the following chapter.

4.1. Integration in mainstream education

There have been several research done on the possibility of using CS in the mainstream and inclusive education.

A thesis conducted by Audrey Dupont in Quebec **analysed the perceptions that children, parents and teachers have on the use of LfPC for the integration of DHH students at school and aimed to identify the causes of these perceptions**. Dupont interviewed 6 students (13-21 years old), 6 parents and 5 teachers on their perceptions of deafness, school integration, interactions, attitudes of other stakeholders as well as the use of LfPC, its advantages and limitations.

The study showed that the use of LfPC was a great support for the inclusion of deaf students, especially to **develop oral and written language**. Interpretation services were perceived as crucial in the success of the students' integration although some teachers felt inconvenienced by the presence of another adult in their classroom. Teachers also often felt insufficiently trained to cater for the needs of DHH students. The students' personality and attitude greatly influenced their peers', parents', and teachers' perception of their inclusion at school. For these students, their inclusion was **not merely educational** but also played an **essential role in their social life**. Raising awareness about these students' situation was also perceived as fostering positive attitudes towards the students' integration in mainstream classes.

4.2. Early exposure and phonological representation

Cued Speech enables early exposure and learning about phonological representations. A study conducted by Alegria, Charlier and Mattys in 2010 studied the **effects of Cued Speech** on two groups of children. It was based on another one conducted in 1982 by Nicholls and Ling, in which they studied the effect of **early and late exposition** to Cued Speech and found that CS improved speech reception in both cases but was even more successful for those having had an early exposure. Using this study as a starting point, Alegria, Charlier, and Mattys decided to organise a test with a group of 31 DHH children who had either an early or a late exposure to LfPC and who were all wearing hearing aids or cochlear implants. The first group was exposed to LfPCat an early stage while the second one had a shorter exposure. The task required them to watch a video without sound where a person pronounced 8 French words and 8 pseudowords with lip-reading alone and then with the addition of LfPC, and to write a transcription using one of the possible spellings of the recognized phonemes.

The results of the study showed that the **combination of lip-reading and LfPC improved the identification of the correct phonemes in both groups** with even **better results** in the group who had an **early exposure to LfPC**. Words were identified with more accuracy than pseudowords in both groups, with pseudowords being again more easily recognized in the “early” group.

The study also analysed the possibility of **LfPC-induced errors** in the recognition of phonemes and concluded that although it is important to acknowledge their existence, **their impact is nonetheless small compared to the advantages** of Cued Speech for spoken language processing.

4.3. Spoken language production

A study conducted by Machart et al. in 2020 observes how the use of French Cued Speech (LfPC) could help improve **speech production in children wearing cochlear implants**. The study involved 16 children from 26 months to 11 years old who had been exposed to LfPC. Among them, 8 had a good cue reading level while the other 8 had a lower level. Both language reception and production were evaluated throughout the experiment. The children were asked to name pictures they saw on a screen. The pictures represented 68 words of 1 to 4 syllables, easily identifiable by all children involved in the study and using all the phonemes in French language. The children's performance was compared to that of normal-hearing children.

The results of this study showed that **children who had better cue reading skills also had better and more stable phonological representation** and therefore **made less mistakes in speech production** than those with a lower level in cue reading. Their scores were close to those of normal-hearing children, which proves the efficiency of LfPC in supporting cochlear implanted children in linguistic and thus social development and school performance.

4.4. Users' voice

Cued Speech helps you overcome the communication barrier

My name is Luke. I have probably not been able to hear since I was six months old. Without hearing aids, I can only hear very loud noises, e.g. the voice of a big bell, a drum, a car horn, a dog barking and a very loud scream. I can hear, or rather feel, infrasound and vibrations. When the orchestra plays loudly, I can feel my chest thumping and everything I touch is trembling. I can hear a little more with hearing aids. Then I don't feel vibrations, but sounds - very pleasant for me. When someone speaks, I can hear a voice, but I cannot hear the words. When a stranger speaks quickly and indistinctly, I don't understand anything and I don't like listening to them.

It is completely different when someone speaks with Cued Speech. **I can see all the words very clearly with the Cued Speech.** I hear a voice, I see the mouth and the hand that is pointing. I imagine each word exactly. It doesn't matter if someone speaks **quickly or slowly**. Every word can be seen.

Even without hearing aids, one can understand if someone speaks with CS. With hearing aids, it is better because it is easier to understand different sentences, e.g. questions and answers. If someone speaks with Cued Speech, it is also possible to understand well **from a distance**, and even when the lips are hard to see. I really like talking to people who speak with Cued Speech. With people who speak beautifully, I can talk for several hours non-stop. I am very lucky because I know many people who speak with Cued Speech.

When I was little and I couldn't speak, my mother taught me to speak with Cued Speech. She was speaking and showing, and I was listening, watching, and understanding. I myself was speaking little and did not cue. After some time, I started speaking with Cued Speech. In kindergarten, my teacher taught deaf children to speak with Cued Speech. I understood them and spoke more and more. Then I studied at the primary school for the deaf and hard of hearing in Lublin. Back then, many teachers spoke with Cued Speech. The lessons weren't difficult. The children understood a lot and were happy to learn. Sometimes when we were taught by a teacher who did not know Cued Speech, there were problems and misunderstandings. During breaks, we also talked with Cued Speech, but only with my classmates. We used sign language with students from other classes.

During my university studies, almost everyone in my group learned to talk to me. Two of my friends were able to speak fluently with Cued Speech and they helped me during lectures and classes, if necessary.

(Łukasz, Cued Speech user, 2014)

Basia and her cueing road

Our daughter Basia started using Cued Speech at the age of 2 and has been using it for about 10-12 years. After the diagnosis of hearing impairment (100-120 dB), she started classes at the Clinic for Children with Hearing Impairment in Toruń and later at a kindergarten in a group for deaf and hard of hearing children.

Cued Speech was introduced at the age of 2 at the Counselling Centre for Children with Hearing Impairment in Toruń; we learned it at the same time at a rehabilitation camp organized by this Centre. My daughter continued to use Cued Speech in the kindergarten in an integration group, and later she used it in primary school. The learning process was adapted to her age and abilities. Long rehabilitation and the continuous use of Cued Speech in the kindergarten and at home **made it possible for her to acquire the pronunciation, listening to and understanding speech.**

In her school there were a few people interested in learning Cued Speech and cueing courses were organised for them. During her primary school years, my daughter had a constant and intensive contacts with cueing people. She is now in a second class of high school and she is using Cued Speech sporadically.

Basia got her first **cochlear implant** in 2010, and then the second one in 2012. Since that time she **gradually has been giving up cueing**. Now she is mainly profiting from implants and using Cued Speech occasionally. We only use single cues when she has her processor off and is unable to lipread effectively.

Basia would not be able to speak if not for Cued Speech. At the beginning, it gave us a chance to understand her needs and to communicate in everyday life. At school - it was a **chance to learn without the need for adapted textbooks or forms of learning.** Cued Speech gave her a chance to speak and understand language in a "natural" form, not as a sign language.

However, Cued Speech was probably most profitable after implantation. Thanks to the Cued Speech **the transition from receiving the speech with cues to hearing it through processors was a fluent process**.

Looking back at my daughter's difficult educational path of almost fifteen years, I can say with utmost confidence that Cued Speech was the pillar and foundation of that path. I think that my daughter would not achieve such a level of speech and language understanding if it was not for Cued Speech and the constant work on improving the pronunciation. The use of cochlear implants, preceded by such intensive rehabilitation with Cued Speech, resulted in her **educational achievements** nowadays: she has been attending one of the best secondary schools in our city and continues her education like all her peers.

(Basia's mother, Kołodziejczyk 2016b)

Cueing - A teacher's aid

I would very much like to emphasize that speaking with cues, though it is difficult in the first year of work, **makes the job enormously easier and is an invaluable aid** to the teacher's work. You don't have to constantly "label" reality by sticking labels on everything around you. Anything that a child asks about can be told him in an understandable manner. Moreover, a child without seeing a graphic pattern of a word can write it down correctly. Pupils gain the opportunity to learn on their own outside the pre-programmed classroom situation and the freedom to communicate with hearing people. I believe that **cueing is a sign of respect for children and a practical recognition of their personal dignity**. (a teacher, Kołodziejczyk 2016b)

Learning to read, write and count with Cued Speech

After 3 years now, the children have been using the Cued Speech willingly and virtually all the time. **They are not afraid of speaking with their hearing peers**; on the contrary, they are able to start to chat with anyone they meet. I am convinced that this increasing familiarity with language directly influences the development of higher mental processes, i.e. their thinking and emotional development. Children are more creative and exploratory and this depends on their level of language development. For me as an initial education teacher, Cued Speech is a supportive tool in a targeted and planned teaching process of **reading, writing, and counting**. Cues help correct articulation errors and improve the clarity of pronunciation. They proved to be a valuable aid in learning to read. Thanks to them children did not miss any sounds, did not change them, read with correct melody, accent, and intonation.
(Initial education teacher, Leszka 2002, in Kołodziejczyk 2016a, 489-490)

Cued Speech – helps to improve articulation

Cued Speech helped me considerably in lip reading pupils with very poor articulation. I noticed that when the children cue, they **speak much more carefully and therefore more clearly.** This difference was very noticeable when reading texts aloud - with and without cues.
(Initial education teacher, Leszka 2002, in: Kołodziejczyk 2016a, 489-490)

Cued Speech in the deaf communication

Cued Speech can also help deaf and hard of hearing students to communicate with each other. Deaf children with poor articulation skills can read each other's speech from their lips! And they read it very accurately, they control their speech and even correct each other and often the teacher! Cued Speech **makes the teachers and their pupils partners in the communication process.**
(Initial education teacher, Leszka 2002, in: Kołodziejczyk 2016a, 489-490)

Cued Speech and the youngest children

The youngest child whom I introduced into Cued Speech was 1 year and 7 months old. Nowadays the diagnosis of hearing impairment can be done so early that children start their early intervention classes well before they are 2 years of age. In most cases the children are very eager to observe the therapist's hand movements that **accompany speech and try to imitate them**. In the case of younger children, cues are used simply in everyday communication, for older children they are also used when **learning to read**.
(speech therapist, in Kołodziejczyk 2016b)

Parents as partners in cueing

I am a speech neuro-therapist. I have been using the Cued Speech method for 15 years and I believe that it can be introduced to a child as early as in the first year of life. The method can be successfully used when working with children with various speech developmental delays. I personally work with children with impaired phonemic hearing and deafness. It helps **develop phonemic hearing and assists in learning to read and write**. I work with children mostly from mainstream schools. As part of the therapy, I instruct parents and this provides a basis for revising and consolidating the therapy material at home. Personally, I prefer to work with parents. When parents cue, children quickly learn lip reading, and this is crucial for them to communicate with others.
(speech neuro-therapist, Kołodziejczyk 2016b)

Parents as partners in cueing

It was the year 2000, and our daughter was two and a half years old when diagnosed as deaf. On that day life stopped for a moment. She was profoundly deaf! Hearing aids would not be of much use and in any case, on one side only.
We contacted a pluri-disciplinary centre. Intensive speech therapy and parental guidance kicked off straightaway, and she was given a hearing aid in her right ear.
We came across another mother with deaf children – we talked – and heard about Langage Parlé Complété (LPC) as it was called at the time: a signed support to lip reading which could help us communicate in French with our deaf daughter.
Like most people, the only thing we had heard about before was Sign Language, but our vision for the future – vague though it was – did not include trying to bring up a child in a language other than our own and which it did not seem possible to master satisfactorily in a short time.
Having found out more about LPC, we were quickly persuaded that it was THE solution, our life saver and way forward with our child. First came a course in LPC in Belgium, followed by a summer school in Switzerland – and very quickly our family adopted this method. Our daughter started understanding her mother tongue. We pinched a few signs from LSFB however (Belgian French Sign Language) to speed up communication – so, using FCSC (Complete Signed and Cued French) with our daughter during her preliminary stages of getting used to LPC as she had already fallen well behind. Her little hearing brother who was two years younger than her progressed at an amazing rate. We had the impression he too was benefitting from LPC! At three she was able to have a Cochlear Implant and that seemed to provide the missing link between comprehension and expressive language. But it was not enough alone. She progressed in huge strides and caught up the massive language delay. We soon dropped FCSC and used LPC alone. Speech therapy continued, with Cues. With our using this method practically constantly as a family, she acquired the French language. When she was four, she was already Cueing herself. We reckon with hindsight, that her appetite for and pleasure in communicating, and her long-continued interest for speech therapy were due for a large part to the ease of understanding and speech she acquired thanks to LPC, and to the wonderful guide that her first speech therapist proved to be.
Our daughter is now 23 years old and is doing a Masters degree at university, having obtained an accountancy diploma. We parents are happy and proud of how she has developed, surrounded as she was by so many kind people – professionals, family and friends. We often think of Orin Cornett who invented Cued Speech, for had he not had this brilliant idea where would we be and where would she be? No-one will ever know...

(Morgane's parents, 2021, Brussels)

4.5. Italian Evolution from CS: the HF-Font

The HF-Font is a system based on gestures, with habilitative and rehabilitative purposes to address both linguistics-communication and learning disorders. The HF-font creator was Simone Becucci, a speech therapist at the "Centro Audiologopedico" at the Istituto dei Sordi of Turin. He spent many years on trials on children with neurodevelopmental disorders and some genetic disease. HF Font can be perceived as a significant evolution from the original CS system and can serve persons with different developmental difficulties.

HF Font developed by Simone Becucci, can be perceived as a significant **evolution of the Cued Speech system** that is used nowadays in Italy, especially in the IST Centre in Torino.

HF-Font uses an **alphanumeric system combined with simplified representations of the articulators** (mouth-tongue and hand gesture) that allow its decoding. It is composed of 25 images combined with graphemes of the Italian language. Vowels are matched only to the representation of the stylised face with the related position of mouth opening. It is possible to see the image and the correspondent grapheme, or the image only (face and hand gesture). We can distinguish two main features of the HF-Font:

- the font as a writing system (images of the font)
- the gesture system recalled by each image (and associated with the grapheme) which therapist, children or both can execute.

Images represent the stylised configuration of the gestures and phoneme, in its most significant and functional features. There is a specific correspondence between configurations and each phoneme of the Italian language (phonological correspondence). There is no distinction between half-obstruent affricate phonemes /ts/-/dz/ and fricative /s/-/z/. This is not an issue, as the couples of sounds' communication and writing are not different. The complex sound associated with the "Q" (/ku/) grapheme is added to facilitate the correct orthographic learning of written Italian. No gesture is associated with the H grapheme, as standing alone does since it does not correspond to a specific phoneme. Hand gestures recall a specific phoneme's oral articulation, describing the dynamic aspects of the articulators' movement/perception/position.

The HF-Font can be used as a font (for reading and writing) and quickly develop structured materials for rehabilitative purposes with little children or children with communication and language deficits. Once the programme is installed (Windows 2007 or next releases), it is possible to select HF-Font among the Word fonts' list.

It can be used in playful settings and activities for pre-school children. Little children (from 24-30 months old) can efficiently execute the HF-Font gestures because they **do not require a great execution precision**. During the training, HF-Font allows reducing direct oral assignments (it is possible to reproduce directly and spontaneously the font's images). Moreover, it **facilitates the reading-writing process** supporting the decoding (reading) and coding (writing). The HF-Font system is used mostly for the improvement and development of the oral language. It is not necessarily linked to graphemes, but it allows using a single gesture configuration to recall a specific sound. HF-Font also supports the **improvement of metaphonological** (e.g., tapping and mix of sounds) or **orthographic skills**. As a result, it can also support learning all the phases of reading-writing process, allowing the step-by-step transition to the mainstream reading-writing thanks to the acquisition of progressive competences. It is a font; thus, it is possible to use it only for some phonemes/graphemes within a word. It facilitates autonomy for verbal expression and oral proficiency with communication scopes (learning phrases and words for improving functional communication).

The early diagnosis and the cochlear implants have fostered the auditory perceptual development of the hearing-impaired children and oral linguistic development. Nevertheless, in many cases, new technologies are not enough to guarantee its development, both in comprehension and production. This may be due to the causes of deafness, the existence of associated disorders, and delayed diagnosis (for example, in migrant children and international adoptions). The history of the education of deaf children shows us that the gesture has mainly been used to support learning the oral language. The gesture, presented by the teacher (or other adults) and then reproduced by the kid, can reinforce oral production and comprehension and support language learning according to one or more parameters: pragmatic, lexical semantics, morphosyntactic, phonetic-phonological. The HF-Font aims at providing incoming and outcoming phonological information to the deaf when he/she is learning the oral language:

INCOMING:

- In the field of perceptual and visual discrimination of similar phonemes during lip-reading (tetto/detto, palla/balla, ecc.).
- During perceptual and auditory training to support the gradual association of articulating a sound/gesture/grapheme.
- To foster memorising sequential syllables of new words, the HF-Font grapheme recalls the gesture even without the speech therapist or teacher's support.
- To stimulate precocious literacy (association of grapheme/gesture/phoneme) recommended especially for severe deafness.

OUTCOMING:

- To help in case of deficit or absence of phonemes, providing proprioceptive-executive information (recalled by the gesture) is useful for executing the articulation.
- To support the correct production of words, as the hand gesture allows the correct articulatory recovery.
- As the HF-Font reproduces the gesture, the children can produce the new lexicon without the direct intervention of the speech therapist/teacher. This supports children's autonomy in production.
- For the same reason, it is useful for the self-correction of the words that have been wrongly automatised (self-regulation).
- The HF-Font representation of both the gesture and the grapheme allows a progressive association between the grapheme and the gesture/phoneme. This supports the grapheme memory retrieval, useful for writing the sound.

The early intervention with deaf children, especially when the deafness is associated with other disorders, requires the use of gestures to support the phonetic-phonological development having the following features:

1. Strong connection with the proprioceptive and articulatory features of the phoneme
2. Easy execution
3. The clear distinction among configurations (phonological correspondence) supports the association gesture/phoneme and its recollection observing the image or with the expert providing with the gesture as a tip, without reproducing the phoneme.
4. Transition to autonomy with step-by-step use of phonemes (without gesture) and standard alphabetic writing.

Conclusion

Cued Speech, as it was shown in this book, is a multi-faceted phenomenon. It was devised more than 50 years ago by a single man – professor Richard Orin Cornett and has since then been inspiring to more and more individuals, families and professionals who want to establish a meaningful communication with their deaf or hard of hearing children, students in both special and inclusive settings, colleagues and peers. Courses on SC have been offered regularly in several countries to parents, teachers, speech therapists and professionals and a system of certification for transliterators have been established. Today the population of people using CS is very diverse – it consists of cuers in more than 60 countries, all of them of different backgrounds, education – and age. Native CS users have started their families and quite often they have been using CS in a second or even a third generation.

As the times change, there is a need to present the system with new means – as an electronic publication and later on – with online sources and workshops, which presents how CS is used in three countries – Begium, Italy and Poland, and describe in detail the contemporary challenges of the deaf and hard of hearing persons in speech perception. Then, the CS system is described, not only with newly prepared graphics, but sometimes - also with some subtle changes in comparison with the version used so far.

CS is presented as a communication tool that is fully compatible with contemporary new phenomenons in deaf education, as it may serve as a valuable tool not only in special educational settings, but also in inclusive education. CS and CI (cochlear implants) have been shown as powerful partners. What is more, as the experience shows, CS can be helpful also in speech therapy and communication with people with other speech and language problems, like Autism Spectrum Disorder (ASD), aphasia, dyslexia, Central Auditory Processing Disorder (CAPD) or Specific Language Impairment (SLI). As CS was adapted to many languages, it may serve as a powerful tool in learning foreign languages – it can be done with the support of cues in the language which is to be acquired.

Good practices from the field, both these coming from rigorously conducted research projects and personal communications with cuers and their families show the potential of CS in changing for better the lives of persons with speech and language challenges.

As authors of this book we do hope it can be an encouraging first step into acquaintance with the Cued Speech system. We wish the readers plenty of meaningful conversations – also with the support of Cued Spech!

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