„Babeş-Bolyai" University, Cluj-Napoca Faculty
of Psychology and Educational Sciences

Psycholinguistic Aspects of Sign Language Communication used by Deafblind Persons

PHD THESIS
SUMMARY

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My Hands

Amanda Stine, 1997
(Deafblind person)

My hands are . . .
My Ears, My Eyes, My Voice . . .
My Heart.
They express my desires, my needs
They are the light that guides me through the darkness

They are free now
No longer bound to a hearing-sighted world
They are free They gently guide me

With my hands I sing
Sing loud enough for the deaf to hear
Sing bright enough for the blind to see

They are my freedom from a dark silent world
They are my window to life
Through them I can truly see and hear

I can experience the sun against the blue sky
The joy of music and laughter
The softness of a gentle rain
The roughness of a dog's tongue

They are my key to the world
My Ears, My Eyes, My voice…
My Heart

They are me

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[1] This list includes the complete contents list from the extended thesis

Key words: *Communication Process, Deafblindness, Multisensorial Impairments, Iconicity, Sign Language, Intervention, Pragmatic Communication.*

INTRODUCTION

Communication, as ability and need of every person, influences all our developmental areas and the infrastructures of relationships. Starting with this premise we focuss our research on the communication of people with sensorial impairments, especially of Deafblind persons. We aim to demonstrate that their communicational process is a very complex one and presents various accomplishments that in many cases are neglected because of the difficulties in expressing and receiving the messages, but also because of very few interactions.

The approach that we have is a psycholinguistic perspective on the Deafblind communication particularities about representing, storing and sharing information and also about the process of linguistic codification, decodification and interpretations of the messages.

The purpose of this thesis is to depict the communicational complex profile of Deafblind persons and to study from psycholinguistic perspective the pragmatic aspects of Deafblind children' and adults' communication.

Communication is a fundamental process of human interrelation defined by the linguistic process, conversation strategies, intersubiectivity, objectivity and mutual undestanding in an interactional context. As Staub (1995) says communication through Sign Language is an evident form of expressing the cognitive processes and has several components that develop during the children' ontological period. Communication is a huge domain that studies the specific psychic processes, the linguistic codes, the various messages and the communication process as a plurivalent phenomenon.

The language represents the most visible indicator of the cognitive processes containing also aspects about spoken language, written language and Sign Language; in this context, the process of combining and expressing the psycholinguistic elements is a very complex one. This way we came to what Pinker (1991) considers: that language is the most precious stone of the cognition crown and that in fact a world without language would be a world without concept and cultures because language influences the way we think, perceive and memorize.

This thesis is structured on seven chapters: the first three are the theoretic foundation, the next three contains empirical studies and the last chapter shows the final conclusions of this work on Deafblind communication.

The first chapter builds the theoretical fundamental framework of the thesis by presenting the main psycholinguistic theories of Tatiana Slama-Cazacu, Jean Piaget & Bärbel Inhelder, Michael Alexander Kirkwood Halliday, Noam Chomsky, George P. Lakoff & Mark L.Johnson and Michael Tomasello. The theoretic argumentation is completed by the Sign Language theories of Christian Cuxac, Phillys Perrin Wilcox, Sherman Wilcox and Adam Kendon. Finally, we underline the particularities of Deafblind communication by describing the Jacques Souriau's theory about congenital Deafblind persons and the Jan van Dijk's theory of assessment, learning and communication in Deafblindness.

The second chapter is dedicated to the presentation of some theoretical and practical aspects of communication in the case of deafblind children and adults. Along to the terminologic and etiologic sides this chapter shows the communication systems as: the objects of reference, large print , Block Alphabet, Braille System, Moon Alphabet, Dactyl Alphabet, Tactile Dactyl Alphabet, Lorm Alphabet, Deafblind Manual Alphabet (Evans), Malossi Alphabet, Tadoma, Sign Language and Tactile Sign Language; also we introduced the

augmentative and alternative systems of communication (pictograms, PCS - Mayer Johnson Symbols, Widgit Symbols, Bliss Symbols, PECS Symbols, Makaton and High-tech systems used by Deafblind persons).In this chapter we analyzed the Tactile Sign Language from linguistic, pragmatic and sociolinguistic perspective and we described the strategies of using Tactile Sign Language with Deafblind children . An important sub/chapter is the one that displays the communication's assessment in the case of Deafblind persons and especially the holistic approach of the assessment; it also contains some assessment instruments that will be used in the empirical studies of this thesis: Callier-Azusa Scale versions G & H and The Pragmatic Profile of Everyday Communications Skills in Adults.

The third chapter emphasizes communication' particularities of Deafblind adults from pragmatic perspective and describes Sign Language from psycholinguistic perspective and the Sign Language interpreting process underlining the competencies of Sign Language and Tactile Sign Language interpreters. In this context we presented a lot of practical aspects about the interpretation process and we underlined the importance of rge Sign Language interpreter in facilitating the communication of Deafblind Adults.

The fourth chapter presents the study of assessing sign iconicity by different categories of persons. In the pilot study we process the initial list of signs to be suitable to the main study that investigates Sign Language according iconicity. We examinated the differences in assessing the sign iconicity by Blind persons, Deaf persons and Teachers of Deafblind students. Also, in this chapter we investigated the effect of familiarity with the signs and the effect of age on assessing the iconicity.

The fifth chapter includes a study that recommend the "*Talking Hands*" intervention program and evaluates its efficiency in the case of Deafblind / Multisensorial impaired children. In the pilot study, the intervention program was tested and validated by experts in the Deafblind field; we evidentiated also the intervention principles proper for the Deafblind / Multisensorial impaired children. The analysis from this study focuse on the differences that appear between the phases of preintervention, postintervention and follow-up.

The sixth chapter focuses exclusively on the pragmatic perspective of deafblind adults' communication. More specifically, the study contained by this chapter is a qualitative analyze of pragmatic communication regarding the functions of communication, the way of responding, interactions and conversations and variations in different contexts of communication of the Deafblind adults. The thematic analyze intended to show the main themes from the semi-structured interviews realized with Deafblind adults and their significant persons.

The seventh chapter contains the final conclusions and presents a general view on the results that we obtained through the empirical studies of this thesis; the educational implications of the results are aspects that can be integrated in the process of teaching and learning in the case of Deafblind / Multisensorial impaired children.

The relevance of this thesis results from the psycholinguistic approach of communication in the case of Deafblind children and adults that intends to contribute at the identification of some educational implications with theoretical and practical value.

THE FIRST STUDY: *THE INVESTIGATION OF DIFFERENCES IN ASSESSING SIGN ICONICITY BY PERSONS WITH SEVERAL SENSORIAL IMPAIRMENTS*

The scientific literature mentioned that iconicity is a fundamental characteristic of Sign Languages (Cuxac, 2001; Taub, 2001; Wilcox, 2004, 2006) and an important fator in the process of sign learning by Deaf children, mentally disabled children and autistic children (Fristoe & Lloyd, 1977; Griffith & Robinson, 1980; Konstantareas, Oxman & Webster, 1978; Pietrandrea, 2002; Ormel, Hermans, Knoors & Verhoeven, 2009; Emmorey & Bosworth, 2010). Iconicity is the similarity between the sign and the object or the action that is represented. Visual iconicity was defined by Brown (1977), Griffith, Panagos & Robinson (1981, 1983, 1990) and Griffith & Robinson (1980) according to the association between the signs and its meaning that help the sign learner to remember the sign. Pizzuto & Volterra (2000) explain the importance of iconicity in structuring the Sign Language lexic and Brennan (1990) is one of the firsts linguists that studied in the context of Sign Language the relation between iconicity and metaphors.

The Sign Language has an evident potential for iconic representations because of the visual-spatial modalities in which it is produced and received. The tridimensional space of Sign Language and the articulators that produce the signs are suitable for iconic representations of spatial information, especially considering the form, location, movements and actions. Iconicity, in the context of the linguistic systems, refers to the structure that preserves the correspondences between the linguistic form and meaning. This fact was studied also by Cuxac (2001), Taub (2001) and Wilcox (2004, 2006) for Sign languages and by Saussure (1916/1986) for the oral languages. In the oral languages, iconicity is rare because the majority of the words are simply arbitrary. In the case of the Sign Languages, the studies of Griffith, Robinson, Panagos (1981) evidentiated the sign iconicity as follows: to some unfamiliarized subjects were showed some signs and they were asked to mention their significance. In the case of hard identification, some explanations were offered and then the subjects were asked if the link between the signs and their significance was precise. In the end, there were only few signs whose significance could not be correlated with the way of signing. This conclusion determined Schlesinger (1987) to affirme that iconicity is the most evident trace of Sign Language. Pointedly, iconicity was best defined by Mandel (1977) as the association that a person can make between the sign and the meaning of the represented concept.

Iconicity was studied, in general, from visual perspective, but we will mention in the following part some studies that combine tactile and visual perception of iconicity. In the Griffith, Panagos & Robinson (1983/1990) study, thirteen Blind persons ranked 100 signs according to their iconicity with the purpose of creating a sign list to be used in educating Deafblind children. Comparing those results with some previous obtained by Griffith & Panagos (1980), the authors conclusioned that Blind and sighted people assess in a similar way the sign iconicity.

Vinson, Cormier, Denmark, Schembri & Vigliocco (2008) investigated the data from 20 Deaf adults that evaluated online the age of acquisition of certain signs, familiarity and iconicity of 300 video recorded signs. Between their conclusions it is one according to that there is a strong correlation between the age of acquisition in the case of several signs and sign iconicity.

Thompson, Vinson & Vigliocco (2010) analyzed the role of iconicity in the linguistic process throught a research in which 25 Deaf adults and 15 hearing persons evaluated online 130 video recorded signs. Their conclusion was that the assessment of sign iconicity depends on the previous linguistic experiences of the subjects and that iconicity plays an important role in the linguistic process because it is involved in the interactions between the meaning and the form of the words.

Starting from the studies about iconicity, we intend by this study to realize a multimodale analyze, involving the visual and tactile perception of iconicity in the case if several ranges of persons.

1.1. The pilot study

The pilot study intended to select the proper signs to be introduced in the iconicity study, from the initial list created by Fristoe & Lloyd (1977) who contained 155 items. The signs from the list were analyzed by the participants at this study according to their utility in the process of communication, complexity of signing and the concrete-abstract level of the signs. Also, we analyzed the presence or the absence of the signs in the Romanian Sign Language; we eliminate all the signs without correspondence in the Romanian Sign Language.

1.1.1. **Participants** on this pilot study were 5 teachers from The Highschool for Visually Impaired Students, Cluj-Napoca, with experience in education and rehabilitation of the Deafblind / Multisensorial impaired children. The participants were all females, with age ranging from 32 to 36 years old (M = 32.40; SD = 1.67) and as professional training they were: two special education teachers, two educators and one therapist, all being familiarised with Sign Language.

1.1.2. Procedure:

The pilot study was accomplished in individual sessions of about 60 minutes each. At the beginning, to the participants were presented the general procedure of the study, the theme targeted by this study and then 5 sample signs were demonstrated for the familiarisation with the task and with the signing particularities. Each participant filled in three questionnaires by which they evaluated all the 155 signs on a scale from 1 to 5 (where 1 is the minimum and 5 is the maximum) according to the sign utility, complexity of signing and the concrete-abstract level of each sign. The answers were recorded on the protocol sheet, marking also different affirmations that participants made about some signs.

1.1.3. Research instruments:

In this pilot study we used the 155 signs list elaborated by Fristoe & Lloyds (1977) and used in studied by Griffith, Panagos & Robinson (1981). The Fristoe & Lloyds initial signs list was created starting from the data collected by Holland (1975) and Lahey & Bloom (1977) from ordinary children taking into account the signs' frequencies included in 20 textbooks for mentally disabled children. Holland (1975) took into consideration for the children with speech impairment the following criterions: (a) the relevance of the words introduced in the vocabulary, (b) the utility of the words that represented objects and present events, (c) the importance of efficient communication that involves more than the linguistic abilities. Lahey & Bloom (1977) added others criterions for selecting the items that have to be introduced in the signs list as: (1) the easiness of a concept to be demonstrated; (2) the word's utility for the child; (3) the arrangement of the items into families of words.

1.1.4. Results

Analysing the internal consistency of the items from the assessment instrument that contained three dimensions, we obtained the following Alpha Cronbach coefficients: α = .85 for the items that assess the signs according to the utility, α = .76 for the items that assess the signs according to the complexity and α = .78 for the items that assess the signs according to the concrete-abstract level. Examining the results that we obtained we can tell that the assessment instrument used in this study has a high level of internal consistency.

An objective of the pilot study was to determine the agreement level between the participants; therefore we calculated the ICC interclass correlation coefficients. The ICC in the case of signs' utility was .854 at 95% confidence interval significant at $p < .001$ showing a high level of agreement between the participants that assess signs utility. The ICC in the case of signs' complexity was .763 at 95% confidence interval significant at $p < .001$ showing a high level of agreement between the participants that assess the signs' complexity. The ICC in the case of signs' level of concreteness and abstractness was.781 at 95% confidence interval significant at $p < .001$ showing a high level of agreement between the participants that assess the signs' concreteness and abstractness.

The results that we obtained permitted us to refine the signs list that ist o be used in the main iconicity study; this way, according to the participants responses from the utility point of view we eliminated from the list the following signs who obtained the smallest means: colour (*M* = 1.20; *SD* = .45), monkey (*M* = 1.50; *SD* = .56), skates (*M* = 1.60; *SD* = .89), newspaper (*M* = 1.60; *SD* = .89), light (*M* = 1.80; *SD* = .84), woman (*M* = 2.00; *SD* = 1).

Taking into account the signs' complexity, the following items were eliminated from the list because were considered too complex: farm (*M* = 3.80; *SD* = .45), restaurant (*M* = 3.80; *SD* = .45), napkin (*M* = 3.40; *SD* = .55), man (M = 3.00; *SD* = .71).

From the pont of view of the concrete/abstract level, the following items were eliminated from the initial signs list: colour (*M* = 3.80; *SD* = .84), meat (*M* = 3.60; *SD* = 1.14), vase (*M* = 3.00; *SD* = 1), restaurant (*M* = 3.00; *SD* = .71).

Analysing all the 155 items, the participants on this study identified a problem of nonconcordance between the initial terms from the source language: BSL (British Sign Language) and ASL (American Sign Language) and the correspondent from the Romanian Sign Language. Because of this we eliminated the signs without a Romanian Sign Language correspondent: *Coca-Cola, hamburger, hot-dog, sandwich, pop-corn*. In the case of the verbs *to work and to do* that are signed similar in Romanian Sign Language, we choosed to keep *to do*. The nouns for *nickel* and *iron* were excluded from the list because the participants did not know the Romanian signs for them saying that these items are not of their interests.

As a result of the qualitative and quantitative analysisfrom this pilot study we obtained a research instrument that contains 133 signs, organised in grammatical categories as follows: 19 verbs, 86 nouns, 3 pronouns, 13 adjectives, 6 adverbs, 5 prepositions and one interjection. Regarding the hand configuration of signing, there are 57 items signed with straight configuration of the fingers, 37 items signed with curved configuration of the fingers and 39 items signed with combined configurations.

1.2. The 1a Study

Investigation of Sign Iconicity Differences between Deaf Persons, Blind Persons and Teachers of Deafblind

1.2.1. Aim and Hypotheses

The aim of this study was to investigate the differences in the assessment of sign iconicity by different categories of persons with sensorial impairments and by teachers of deafblind students. The objectives of the study were:

- To investigate the sign iconicity differences between Deaf people, Blind people and Teachers of deafblind students.
- To analyze the differences in assessing sign iconicity between familiarized and unfamiliar people with Sign Language.
- To investigate the relation between the grammatical categories and the signing configurations of the hands.

The hypotheses of the study were: 1) The Blind participants, the Deaf participants and the Teachers of Deafblind students, assess different the signs iconicity according to the grammatical categories: verbs, nouns, pronouns, adjectives, adverbs, prepositions and interjections; 2) The Blind participants, the Deaf participants and the Teachers of Deafblind students, assess different the signs iconicity according to the signing configurations; 3) The subjects familiar with Sign Language will assess different the sign iconicity; 4) In the case of the Deaf the correlations between the grammatical categories and the signing configurations will be stronger than in the case of the Blind and the Teachers of deafblind students.

1.2.2. Method

1.2.2.1. Participants

The participants to this study were 72 persons, aged between 14 and 56 years old, M = 27.26 (SD = 12.04), females N = 45 and males N = 27.

The subjects were divided into three groups according to their impairment:

The group of Blind persons contained 22 persons, M = 24.41 (SD = 12.07) from The Highschool for Visually Impaired Students, Cluj-Napoca; 14 high-school students and 8 blind teachers. In the moment we began the study, all were totally blind, but 6 of them presented residual vision before the age of 7 years old.

The group of Deaf persons contained 25 persons, M = 23.54 (SD = 12.80), 18 high-school students from The Highschool for Hearing Impaired Students, Cluj-Napoca and 8 Deaf adults from the Cluj Deaf community.

The group of Teachers of Deafblind students contained 24 valid persons, M = 33.92, (SD = 8.19) from the groups for deafblind / MSI children that function at The Highschool for Visually Impaired Students, Cluj-Napoca.

From the point of view of *familiarity with the Sign Language*, 22 participants had no previous knowledge of Sign Language, 23 de participants were familiar at a medium level and 27 participants were very familiar with Sign Language.

All the participants were asked about their agreement to participate to this studz and for the participants who were under 18 years of age, a written agreement was asked from their legal representative.

1.2.2.2. Procedure

The experimental study was realized in individual sessions of about 30 minutes each. In the beginning, to the participants were presented the aim of the study and the working procedure,

then a sample of 5 signs was showed for familiarization with the task and with the signing particularities. Each participant was asked to assess the 133 signs according to their iconicity on a scale from 1 to 5 (where 1 was minim iconicity and 5 maxim iconicity). The responses were recorded on the protocol sheet, noticing the participants' affirmations about particular signs. The Blind participants received by tactile adaptation all the 133 signs and, they were asked to write the answers in Braille and then we transcribe all it on the protocol sheet.

1.2.2.3. Research Instruments

In this study we used a sign list that was tested in the pilot study. This list contained 133 signs grouped in grammatical categories as follows: 19 verbs, 86 nouns, 3 pronouns, 13 adjectives, 6 adverbs, 5 prepositions and one interjection. According to the signing configuration of the hand there are 57 signs with strainght configuration (the signs are produced with the fingers in straight positions), 37 signs with curved configuration (the signs are produced with the fingers in curved positions) and 39 signs with combined configuration (the signs have an element realized with straight position of the fingers and the other element is realized with curved position of the fingers).

1.2.3. Results

All the analysiswere done using ANOVAs with between-subjects factors (1) type of participants' impairment (hearing impairment, visual impairment) and (2) familiarity (the level of Sgn language knowledge)

Dependent variables were the grammatical categories: verbs, nouns, pronouns, adjectives, adverbs, prepositions, interjections and also the hand configurations of signing (straight, curved or combined). A significance level of .05 was used.

Table 1 provides an overview of the results for factor (1) according to grammatical categories and Table 2 provides an overview of the results for factor (2) according to hand configuration of signing.

With regard to the ***nouns***, ANOVA revealed significant effects of the factor *type of participants' impairment*: F (2, 68) = 8.33, MSE = .32, $p < .01$, η^2 = .20. The *post hoc* analyze using Scheffe indicated that Blind persons *(*M = 3.90, AS = .62*)* assess the nouns as having a lower iconicity (t (48) = .44, $p < .05$) then the Deaf *(*M = 4.34, AS = .61*)*, and the Deaf persons assess iconicity at a higher level (t (48) = .63, $p < .01$) comparing to the Teachers of Deafblind students *(*M = 3.71, AS = .44*)*.

An ANOVA showed significant effects of the factor *type of participants' impairment* on the ***adjectives***: F *(2, 69)* = 17.25, MSE = .47, $p < .001$, η^2 = .33. The *post hoc* analyze using Scheffe indicated that Teachers of Deafblind students *(*M = 3.25, AS = .72*)* assess a lower level of iconicity (t (48) = 1.13, $p < .001$) then the Deaf *(*M = 4.37, AS = .62*)* and the Deaf persons assess iconicity at a higher level (t (48) = .73, $p < .01$) then the Blind persons *(*M = 3.64, AS = .73*)*

ANOVA revealed significant effects of the factor *type of participants' impairment* on the ***adverbs***: F *(2, 65)* = 5,84, MSE = .57, $p < .01$, η^2 = .15. The *post hoc* analyze using Scheffe indicated that Blind persons *(*M = 3.63, AS = .73*)* assess the adverbs as having a lower iconicity (t (44) = .57, $p < .05$) then the Deaf *(*M = 4.21, AS = .88*)* and the Deaf persons assess iconicity at a higher level (t (48) = .71, $p < .01$) comparing to the Blind persons an the Teachers of Deafblind students *(*M = 3.50, AS = .57*)*

The factor *type of participants' impairment* had a significant effect on the ***straight configuration*** ANOVA revealing: F *(2, 69)* = 6.36, MSE = .32, $p < .05$, η^2 = .16. The *post hoc* analyze using Scheffe indicated that Deaf persons *(*M = 82.44, AS = 13.94*)* assess iconicity at a higher level (t (48) = .55, $p < .01$) then the Teachers of deafblind students *(*M = 80.28, AS = 7.84*)* and there are no significant differences in assessing iconicity with regard of Blind persons *(*M = 82.44, AS = 13.94*)*.

ANOVA revealed significant effects of the factor *type of participants' impairment* on the ***curved configuration***: F *(2,69)* = 6.33, MSE = .31, $p < .05$, η^2 = .15. The *post hoc*

analyze using Scheffe indicated that Blind persons *(M* = 3.91, *AS* = .62*)* assess iconicitz at a lower level (*t* (48) = .40, *p* < .05) then the Deaf *(M* = 4.31, *AS* = .58*)* and the Deaf persons assess iconicity at a higher level (*t* (48) = .53, *p* < .01) then the Teachers of Deafblind students *(M* = 3.77, *AS* = .45*)*

ANOVA revealed significant effects of the factor *type of participants' impairment* on the ***combined configuration***: *F (2,69)* = 7,21, *MSE* = .30, *p* < .01, η^2 = .17. The *post hoc* analyze using Scheffe indicated that Deaf persons *(M* = 4.30, *AS* = .66*)* assess iconicity at a higher level (*t* (48) = .58, *p* < .01) then the Teachers of deafblind students *(M* = 3.72, *AS* = .40*)* and there are no significant differences in assessing iconicity with regard of Blind persons *(M* = 3.99, *AS* = .52*).*

ANOVA did not show significant effects of the factor *type of participants' impairment* on the following grammatical categories **verbs**: *F*(2,69) = .04, *MSE* = .28, *p* >.05,η^2 = .001, **pronouns** : *F*(2,69) = 2,80, *MSE* = .70, *p* >.05, η^2 = .07, **prepositions**: *F*(2,69) = 1,48, *MSE* = .35, *p* >.05,η^2 = .04 and **interjections**: *F*(2,69) = .83, *MSE* = 1,11, *p* >.05,η^2 = .02.

The influence of the *type of participants' impairment* on the grammatical categories and hand configuration of signing is showed by the following charts:

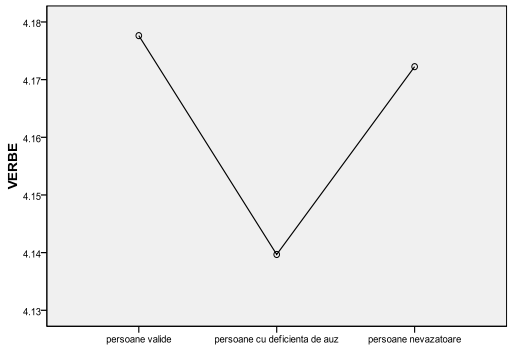


Figure 1: ***Influence of the impairment type on the verbs***

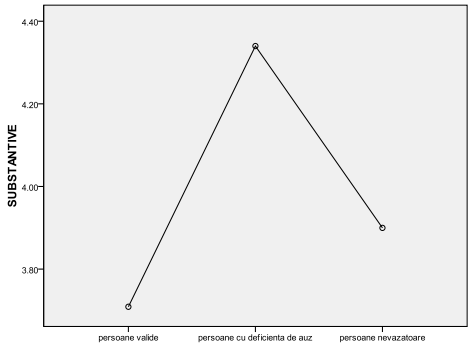


Figure 2: ***Influence of the impairment type on the nouns***

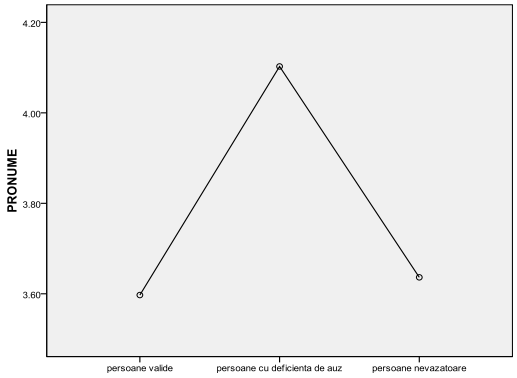


Figure 3: ***Influence of the impairment type on the pronouns***

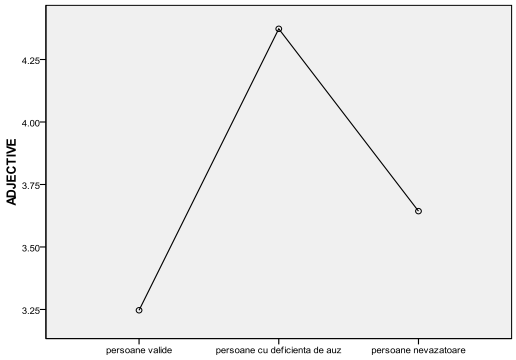


Figure 4: ***Influence of the impairment type on the adjectives***

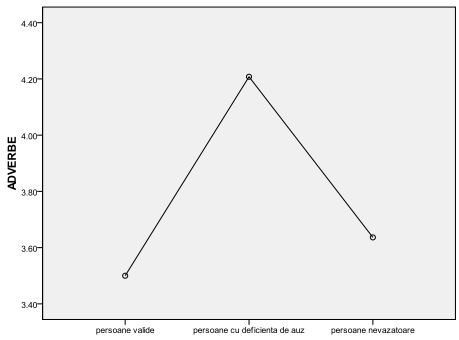


Figure 5: ***Influence of the impairment type on the adverbs***

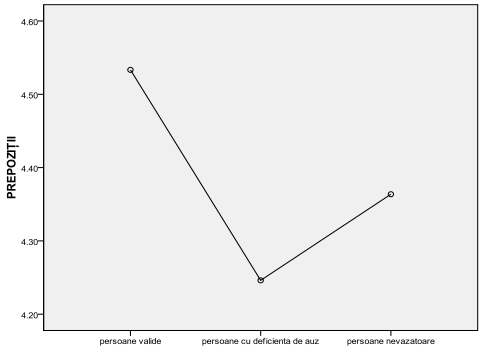


Figure 6: ***Influence of the impairment type on the prepositions***

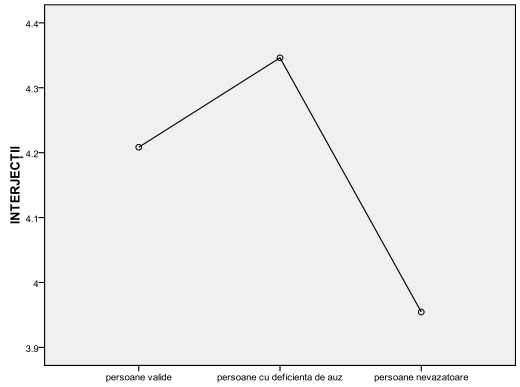


Figure 7: ***Influence of the impairment type on the interjections***

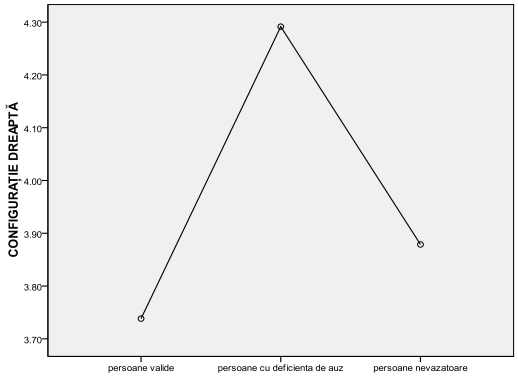


Figure 8: ***Influence of the impairment type on the straight configuration***

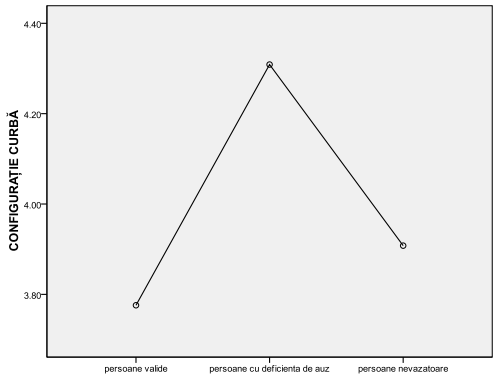


Figure 9: ***Influence of the impairment type on the curved configuration***

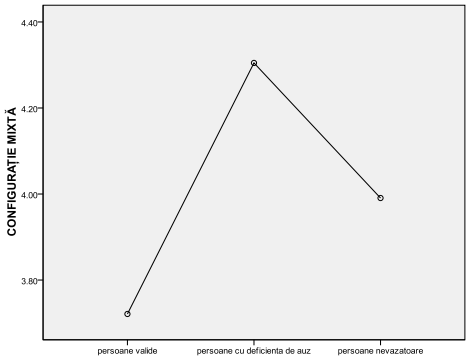


Figure 10: ***Influence of the impairment type on the combined configuration***

Means and standard deviations for the assessment of iconicity by subjects with different levels of familiarity according to the grammatical categories and the hand configuration of signing are provided in the Table 3 and 4

ANOVA revealed significant effects of the *familiarity* factor on the ***nouns***: F (2, 68) = 8,39, MSE = .31, p < .001, η^2 = .20. The *post hoc* Scheffe analyze indicated that the persons with medium familiarity (M = 3.67, AS = .43) assessed the sign iconicity at a lower level (t (48) = .65, p < .01) then the persons who were very familiar with Sign Language (M = 4.31, AS = .61)

ANOVA revealed significant effects of the *familiarity* factor on the ***adjectives***: F (2, 69) = 15.03, MSE = .50, p < .001, η^2 = .30. The *post hoc* Scheffe analyze indicated that the persons without knowledge of Sign Language (M = 3.69, AS = .71) assessed iconicity at a lower level (t (44) = .63, p < .05) then the persons who were very familiar with Sign Language (M = 4,31, AS = .68), and the persons with medium familiarity (M = 3.22, AS =

.73) assess the sign iconicity at a lower level (t (48) = 1.08, $p < .001$) compaired to the persons very familiar with Sign Language.

ANOVA revealed significant effects of the *familiarity* factor on the ***adverbs*** $F(2,65) = 6.11$, $MSE = .57$, $p < .01$, $\eta^2 = .16$. The *post hoc* Scheffe analyze indicated that the persons with medium familiarity ($M = 3.47$, $AS = .58$) assessed the sign iconicity at a lower level (t (44) = .74, $p < .01$) then the persons who were very familiar with Sign Language ($M = 4.20$, $AS = .89$)

With regard to the ***signing configurations,*** ANOVA revealed significant effects of the *familiarity* factor on the ***straight configuration****: F (2, 69) = 6.57, $MSE = .32$, $p < .01$, $\eta^2 = .16$.* The *post hoc* Scheffe analyze indicated that the persons with medium familiarity ($M = 3.70$, $AS = .44$) assessed the sign iconicity at a lower level (t (48) = .58, $p < .01$) then the persons who were very familiar with Sign Language ($M = 4.27$, $AS = .63$)

ANOVA revealed significant effects of the *familiarity* factor on the ***curved configuration:*** $F(2,69) = 6.17$, $MSE = .30$, $p < .01$, $\eta^2 = .15$. The *post hoc* Scheffe analyze indicated that the persons with medium familiarity ($M = 3.70$, $AS = .45$) assessed the sign iconicity at a lower level (t (48) = .54, $p < .01$) then the persons who were very familiar with Sign Language ($M = 4.29$, $AS = .59$)

ANOVA revealed significant effects of the *familiarity* factor on the ***combined configuration:*** $F(2,69) = 6,75$, $MSE = .30$, $p < .01$, $\eta^2 = .16$ The *post hoc* Scheffe analyze indicated that the persons with medium familiarity ($M = 3,70$, $AS = .39$) assessed the sign iconicity at a lower level (t (48) = .57, $p < .01$) then the persons who were very familiar with Sign Language ($M = 4.27$, $AS = .67$)

ANOVA did not show a significant effect of the *familiarity* factor on **verbs** : $F(2,69) = .05$, $MSE = .28$, $p > .05$, $\eta^2 = .001$, **pronouns :** $F(2,69) = 2,65$, $MSE = .71$, $p > .05$, $\eta^2 = .05$, **prepositions** : $F(2,69) = .68$, $MSE = .36$, $p > .05$, $\eta^2 = .01$ and **interjections** : $F(2,69) = .74$, $MSE = 1,11$, $p > .05$, $\eta^2 = .02$.

The influence of *familiarity* on the grammatical categories and hand configuration of signing is showed by the following charts:

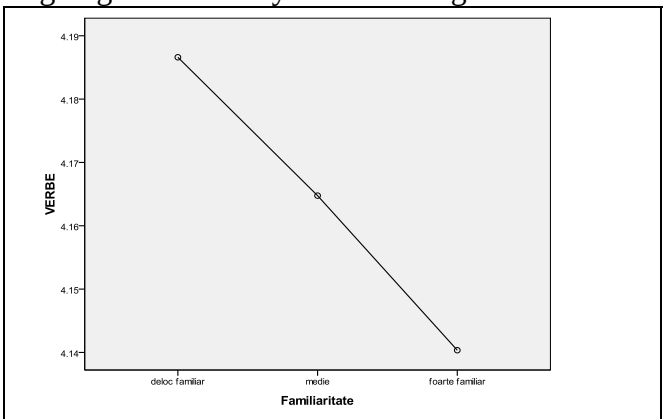


Figure 11: ***Influence of familiarity on the verbs***

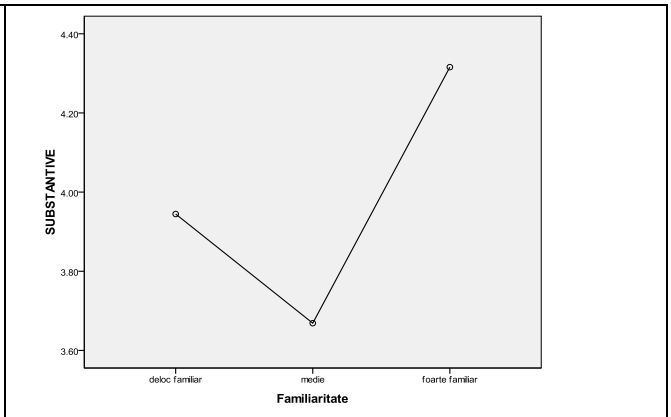


Figure 12:***Influence of familiarity on the nouns***

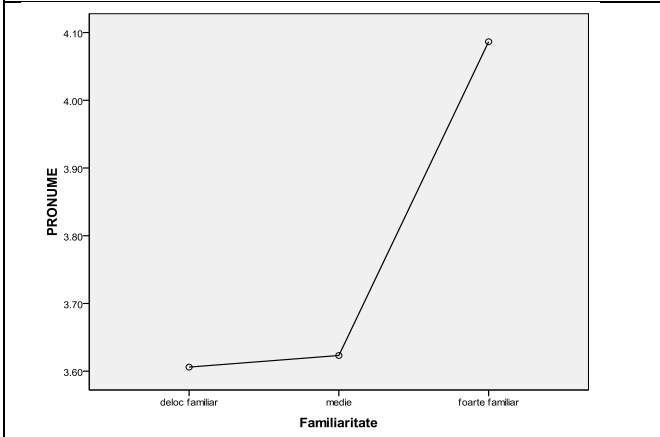


Figure 13: ***Influence of familiarity on the pronouns***

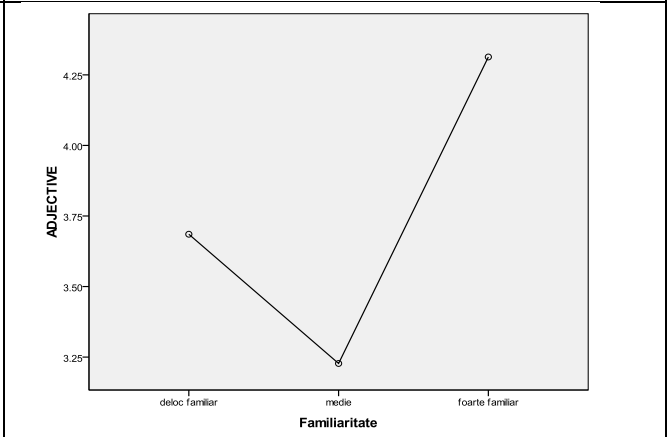


Figure 14: ***Influence of familiarity on the adjectives***

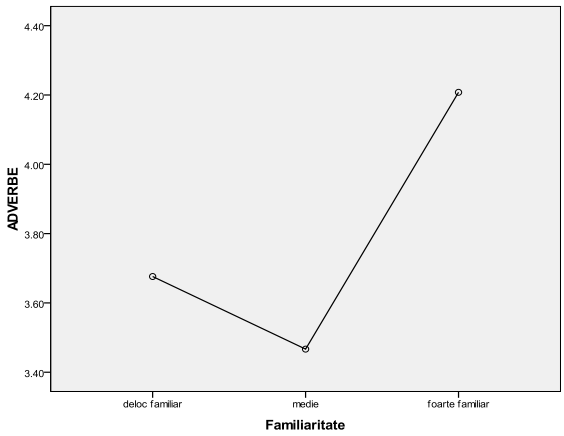


Figure 15: ***Influence of familiarity on the adverbs***

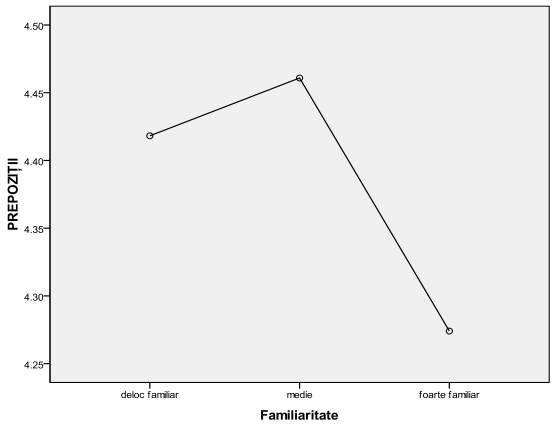


Figure 16: ***Influence of familiarity on the prepositions***

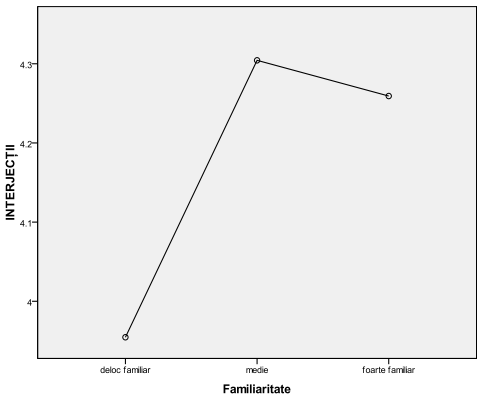


Figure 17: ***Influence of familiarity on the interjections***

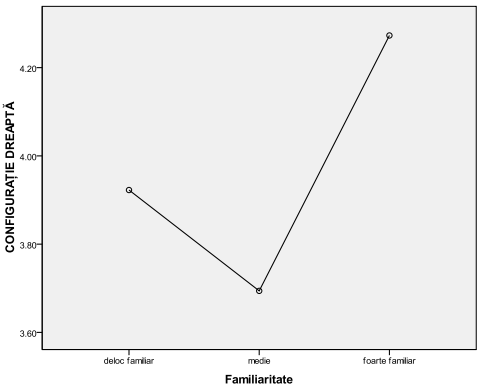


Figure 18: ***Influence of familiarity on the straight configuration***

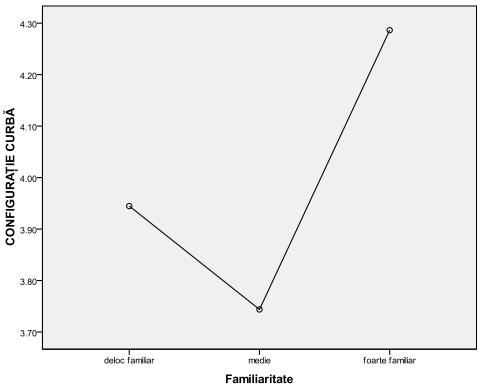


Figure 19: ***Influence of familiarity on the curved configuration***

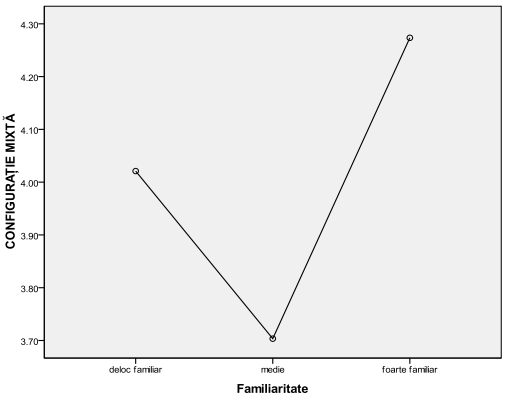


Figure 20: ***Influence of familiarity on the combined configuration***

Another aspect that interested us was to identify and measure the correlations between the grammatical categories and the hand configuration of signing. As we observe in the Table 5, the majority of grammatical categories: nouns, pronouns, adjectives, adverbs and prepositions are positive correlated to the straight, curved and combined configurations. More specific, there are strong positive correlations between the nouns and the straight configuration: $r = .98$, $p < .01$, curved configuration: $r = 97$, $p < .01$ and combined configuration: $r = 96$, $p < .01$, between the pronouns and the straight configuration: $r = .71$, $p < .01$, curved configuration: $r = 68$, $p < .01$ and the combined configuration: $r = 74$, $p < .01$, between adjectives and the straight configuration: $r = .91$, $p < .01$, curved configuration: $r = 89$, $p < .01$ and combined configuration: $r = 89$, $p < .01$ and also between the adverbs and the

straight configuration: $r = .78$, $p < .01$, curved configuration: $r = 73$, $p < .01$ and combined configuration: $r = 79$, $p < .01$.

We tested also the hypotheses according to which the correlation registred in the case of Deaf persons are stronger than those of the others impairments. As we can observe in Table 7, all the correlation registred in the case of the Deaf are significant as follows: between nouns and verbs: $r = .88$, $p < .01$, nouns and pronouns: $r = .83$, $p < .01$, nouns and adjectives: $r = .86$, $p < .01$, nouns and adverbs: $r = .86$, $p < .01$, nouns and prepositions: $r = .89$, $p < .01$; between pronouns and verbes: $r = .67$, $p < .01$, pronouns and adjectives: $r = .84$, $p < .01$, pronouns and adverbs: $r = .76$, $p < .01$, pronouns and prepositions: $r = .82$, $p < .01$; between adjectives and verbs: $r = .78$, $p < .01$, adjectives and adverbs: $r = .82$, $p < .01$, adjectives and prepositions: $r = .93$, $p < .01$; between adverbs and verbs: $r = .83$, $p < .01$, adverbs and prepositions: $r = .79$, $p < .01$; between prepositions and verbs: $r = .81$, $p < .01$.

Regarding the visual impairment there are significant correlations (see Table 6) between: nouns and verbs: $r = .88$, $p < .01$, nouns and pronouns: $r = .63$, $p < .01$, nouns and adjectives: $r = .91$, $p < .01$, nouns and adverbs: $r = .52$, $p < .01$, pronouns and verbs: $r = .73$, $p < .01$, pronouns and adjectives: $r = .67$, $p < .01$, adjectives and verbs: $r = .79$, $p < .01$, adjectives and adverbs: $r = .45$, $p < .05$.

Regarding the Teachers of Deafblind students, there are significant correlations (see Table 8) between: nouns and verbs: $r = .76$, $p < .01$, nouns and adjectives: $r = .80$, $p < .01$, nouns and adverbs: $r = .70$, $p < .01$, nouns and prepositions: $r = .48$, $p < .05$; between pronouns and adjectives: $r = .55$, $p < .01$, pronousn and adverbs: $r = .74$, $p < .01$, pronouns and prepositions: $r = .43$, $p < .05$; between adjectives and verbs: $r = .75$, $p < .01$, adjectives and adverbs: $r = .74$, $p < .01$, adjectives and prepositions: $r = .54$, $p < .01$; between adverbs and verbs: $r = .71$, $p < .01$, adverbs and prepositions: $r = .65$, $p < .05$.

Examining the correlation between the verbs and the corespondent nouns we observe positive correlations for example in „to sit – chair”; analysing the verbs with the same movement but with diffrenet directions, we observe a positive correlation in the case „to give – to bring – to come”: investigating the signs from different grammatical categories but with the same hand configuration and similar movements, we observe positive coralation in the case of „who - airplane”; analysing the indicative signs (for example „nose - eys”) we notice a positive correlation; investigating the referential signs we descover a positive correlatopn in the case „happy - sad”. All the coralation mentioned in the previous paragraph were significant at $p < .01$.

Table 1: ***Means (M) and standard deviations (SD) for the iconicity assessment by participants with different impairments according to the grammatical categories***

Participants' category						
	Blind		Deaf		Teachers of Deafblind students	
Dependent variables	*M*	*SD*	*M*	*SD*	*M*	*SD*
Verbs	4.17	.56	4.14	.65	4.18	.31
Nouns	3.90	.62	4.34	.61	3.71	.44
Pronouns	3.64	.81	4.10	.94	3.60	.75
Adjectives	3.64	.73	4.37	.62	3.25	.72
Adverbs	3.63	.73	4.21	.89	3.50	.57
Prepositions	4.36	.51	4.24	.81	4.53	.33
Interjections	3.95	1,29	4.35	.94	4.21	.93

Table 2: ***Means (M) and standard deviations (SD) for the iconicity assessment by participants with different impairments according to the hand configuration of signing***

Participants' category						
	Blind		Deaf		Teacheres of Deafblind students	
Dependent variables	*M*	*AS*	*M*	*AS*	*M*	*AS*
Straight configuration	3.88	.61	4.29	.64	3.79	.45
Curved configuration	3.91	.62	4.31	.58	3.77	.45
Combined configuration	3.99	.52	4.30	.66	3.72	.40

Table 3: ***Means (M) and standard deviations (SD) for the iconicity assessment by participants with different levels of familiarity according to the grammatical categories***

Familiaritaty						
	Without knowledge of Sign Language		Medium level of familiarity		High level of familiarity	
Dependent variables	*M*	*SD*	*M*	*SD*	*M*	*SD*
Verbs	4.19	.56	4.16	.31	4.14	.63
Nouns	3.94	.62	3.67	.43	4.31	.61
Pronouns	3.60	.78	3.62	.79	4.09	.86
Adjectives	3.69	.71	3.22	.73	4.31	.68
Adverbs	3.68	.72	3.47	.58	4.20	.89
Prepositions	4.42	.50	4.46	.33	4.27	.80
Interjections	3.95	1.30	4.30	.82	4.26	1.02

Table 4: ***Means (M) and standard deviations (SD) for the iconicity assessment by participants with different levels of familiarity according to the hand configuration of signing***

Familiaritaty						
	Without knowledge of Sign Language		Medium level of familiarity		High level of familiarity	
Dependent variables	*M*	*SD*	*M*	*SD*	*M*	*SD*
Straight configuration	3.92	.61	3.70	.44	4.27	.63
Curved configuration	3.94	.61	3.74	.45	4.29	.59
Combined configuration	4.02	.51	3.70	.39	4.27	.67

Table 5: ***Correlations between the grammatical categoriesc and the hand configuration of signing***

	1	2	3	4	5	6	7	8
1 Nouns	1	.68**	.91**	.76**	.43	.98**	.97**	.96**
2 Pronouns	.68**	1	.69**	.65**	.41	.71**	.68**	.74**
3 Adjectives	.91**	.69**	1	.72**	.34**	.91**	.89**	.89**
4 Adverbs	.76**	.65**	.72**	1	.48**	.78**	.73**	.79**
5 Prepositions	.43**	.41**	.34**	.48**	1	.47**	.43*	.51**
6 Straight configuration	.98**	.71**	.91**	.79**	.47**	1	.95**	.94**
7 Curved configuration	.98**	.68**	.89**	.73**	.43**	.95**	1	.93**
8 Combined configuration	.96**	.74**	.89**	.79**	.51**	.94**	.93**	1

Note: *$p < .05$; **$p < .01$

Table 6: ***Correlations between the grammatical categories in the case of Blind People***

	Verbs	1	2	3	4	5
1 Nouns	.88**	1	.63**	.91**	.52**	.12
2 Pronouns	.73**	.63**	1	.67**	.31	-.13
3 Adjectives	.79**	.91**	.67**	1	.45*	.17
4 Adverbs	.26**	.52*	.31	.45*	1	.22
5 Prepositions	-.06	.12	-.13	.17	.22	1

Note: *$p < .05$; **$p < .01$;

Table 7: ***Correlations between the grammatical categories in the case of Deaf People***

	Verbe	1	2	3	4	5
1 Nouns	.88**	1	.83**	.93**	.86**	.84**
2 Pronouns	.67**	.83**	1	.84**	.76**	.82**
3 Adjectives	.78**	.93**	.84**	1	.82**	.93**
4 Adverbs	.83**	.86**	.76**	.82**	1	.79**
5 Prepositions	.81**	.86**	.82**	.93**	.79**	1

Note: *$p < .05$; **$p < .01$

Table 8: ***Correlations between the grammatical categories in the case of the Teachers of Deafblind students***

	Verbe	1	2	3	4	5
1 Nouns	.76**	1	.36	.80**	.70**	.48*
2 Pronouns	.29	.36	1	.55**	.74**	.43*
3 Adjectives	.75**	.88**	.55**	1	.74**	.54**
4 Adverbs	.71**	.70**	.74**	.74**	1	.56**
5 Prepositions	.34	.48*	.43*	.54**	.56**	1

Note: *$p < .05$; **$p < .01$

1.2.4. Discussions

The purpose of this study is to investigate the differences in assessing sign iconicity by Blind persons, Deaf persons and Teachers of Deafblind students and by persons with different level of familiarity with Sign Language.

The results indicated that there are significant differences between the way the Blind persons, Deaf persons and Teachers of Deafblind students assess iconicity of different grammatical categories as: nouns, adjectives and adverbs or of different hand configurations of signing: straight, curved and combined. We noticed a pattern of the influences of grammatical categories on the dependent variable as follows: there are no significant differences between the Blind and the sighted, but there are significant differences between the deaf and all the others participants. The Deaf assess iconicity in majority of the grammatical categories and configurations of signing at higher level then the other categories of participants. Our results confirm the first hypotheses of the study and they confirm the studies of Griffith, Panagos & Robinson (1983, 1990) that demonstrated that blind persons assess iconicity similar to the sighted.

According to Vigliocco, Vinson, Woolfe, Dye & Woll (2005) in the case of Deaf persons that use Sign Language as main way of communication, the signs represent the meaning of the words; this fact explain why the Deaf persons assess iconicity at a higher level than the other categories of participants. The same researchers mentioned that linguistic process of the Deaf is focused on iconicity. They proved that mental imagery and language are not separate cognitive modules and that in the Sign Language there are more interactions based on iconicity between mental imagery and language that in the context of oral languages.

As the results indicated, between the three categories of participants there are no significant differences in the assessment of iconicity in the cases of: verbs, pronouns, prepositions and interjections. About this, a possibil argument can be that of Kousta, Vigliocco, Vinson, Andrews, Del Campo (2011) that abstract concept are represented by verbs and the processes of actions are similar to all the subjects; the verbs express the process and are express in a similary way when the action is made. There are differences between verbs and nouns because of cerebral functions and according to the neurolinguistic researchers Shapiro, Moo, Caramazza (2006), the left temporal cerebral aria is responsable of integrating the nouns into phrases and the left inferior and median frontal aria integrate the verbs into phrases.

Analysing sign iconicity from the perspective of hand configuration Anca (2006) says that iconicity of the third grade refers to the hand configuration of signing, the location on the body or in the space, hand orientation and hand movements. In this context, it is important the relationship between these signs parameters and the process of creating reference microspaces by the reorientation of the sigher view. The cognitive operations and the development of Deaf thinking are builded upon the processing of iconic imagery and manipulating them throught logic inference.

Analysing our results from the perspective of participants' familiarity with Sign Language we have to remember that Vinson, Cormier, Denmark, Schembri & Vigliocco (2008) underlined that the components integrated into the concept of familiarity are not evidentiated by fundamental studies. Stadthagen-Gonzalez & Davis (2006) says that familiarity interact with lexical frecvences that is a variable with a powerfull high effect on the performance in solving lexical tasks.

Familiarity of the subjects with the signs, in the present study is an independent variable with the effect on the assessing iconicity, determining semnificative differences in the case of nouns, adjectives, adverbs and of the straight, curved and combined configuration of signing. More specific, the persons that present a mediul familiarity with the signs evaluated sign iconicity at a lower level then the persons very familiar with Sign Language. Familiarity with the signs did not determined significant differences in the cases of verbs, pronouns, prepositions and interjections. These results confirm the study of Gernsbacher (1984) who showed that familiarity is a superior predictor that influences the grammatical process. In the context of the iconicity, familiarity determines a better sign assessment taking inti account the

aspects about signs meaning.

The strong correlations between the grammatical categories and the signing configuration show their tendencies to coincide, fact that demonstrate that in Sign Language is adequate to classificate the signs according the grammatical categories, but also according to the hand configuration of signing.

The results of our study confirmed the presumption according to which in the case of the Deaf the correlation between the grammatical categories are stronger then in the case of others participants: blind and Teachers of Deafblind students. These results confirm the studies of Thompson, Vinson & Vigliocco (2010) who proved that in the case of the Deaf, the grammatical aspects of the language interact with experience and mental imagery. Wu & Coulson (2007a) affirmed that iconic signs activate representations based on the concept meaning that are compatible with the linguistic forms; our results, that confirm the hypotheses of this thesis, suggest that the assessment of iconicity depends on the subject's experience with the signs and on the particularities of the cognitive processes that are involved.

1.3. The 1b Study

Several psycholinguistic studies underlined that the adults without impairments who do not know Sign Language perceive spontaneously the meaning of those signs with high iconicity and this fact can facilitate the Sign Language learning by hearing people (Klima & Bellugi, 1979; Pizzuto şi Volterra, 2000). Regarding the way children perceive iconicity, the studies evidentiated that they do not perceive the different levels of sign iconicity and this fact is proved in the prossess of language acquisition when children learn in the same way abstract and iconic signs (Meier, 1991).

Ormel, Hermans, Knoors & Verhoeven (2009) mentioned that there are no relevant studies about assessing iconicity taking into account age differences. Vinson, Cormier, Denmark, Schembri & Vigliocco (2008) indicated that sign learning is not influenced by the subjects' age and Thompson, Vinson & Vigliocco (2010) conclude that there are no evident differences between age groups in the way they assess sign iconicity.

1.3.1. Aim and hypotheses

Starting from the aspects mentioned above, the purpose of this study was to investigate the differences in assessing sign iconicity by two groups with different level of training. The hypothese of this study is that there are no differences in the way persons with different level of training assess sign iconicity.

1.3.2. Method

1.3.2.1. Participants

In this study participated 45 persons with age ranged between 14 and 56 years (M = 25.77, SD = 10.84). The participants, 39 females and 6 males were divided in two groups according to their level of training:

The teachers group contained 24 valid persons, M = 33.92 , AS = 8.19, 23 females and one male; they were all teachers at The School for Visually Impaired Children from Cluj-Napoca, being special education teachers or educators for students with Deafblindness or multisensorial impairments.

The highschool students group contained 21 valid young adults, M = 16 ani, AS = .78, 16 girls and 5 boys from the *Emanuel* High School, Cluj-Napoca.

1.3.2.2. Procedure

The study was realized in sessions of about 30 minutes. For the beginning, to the participants

were presented the aim of the study and the working procedure, then a sample of 5 signs was showed for familiarization with the task and with the signing particularities. Each participant was asked to assess the 133 signs according to their iconicity on a scale from 1 to 5 (where 1 was minim iconicity and 5 maxim iconicity). The responses were recorded on the protocol sheet, noticing the participants' affirmations about particular signs.

1.3.2.3. Research Instruments

The materials and the procedure of this study were similar to those used and described in the study 1a.

1.3.3. Results

The analysisof the data was made by *t* test for independent samples and for measuring the effect sise we used the *d* Cohen coefficient. A significance level of .05 was used.

The dependent variables were the grammatical categories: verbs, npuns, pronouns, adjectives, adverbs, prepositions and hand configurations of signing: straight, curved and combined.

T test did not revealed significant differences between the tho groups of subject that assess the sign iconicityof the verbs: $t(43) = 1.20$, *ns*., nouns: $t(43) = 1.80$, *ns*.; adjectives: $t(43) = .53$, *ns*., adverbs: $t(43) = -.13$, *ns*., prepositions: $t(43) = -.29$, *ns*., straight configuration: $t(43) = 1.54$, *ns*., curved configuration: $t(43) = 2.11$, *ns*. and combined configuration: $t(43) = .98$, *ns*. *T* test revealed only one significant differences between the two groups of subjects in the case of the pronouns: $t(43) = 3.49$, $p < .01$.

Other aspects that interested us were the correlations between grammatical categories and the configuration and to see if correlations are similar in the case of highschool students and of the graduate persons.

As we notice in Table 10, in the case of the highschool students the nouns and the adjectives are positive correlated to the hand configurations; the correlation between the nouns and the straight configuration had $r = .97$, $p < .01$, nouns and curved configuration correlated: $r = 96$, $p < .01$ and the nouns correlated with the combined configuration $r = 96$, $p < .01$, the correlation between the adjectives and the straight configuration had $r = .85$, $p < .01$, adjectives correlated with curved configuration $r = 92$, $p < .01$ and the adjectives correlated with the combined configuration $r = 84$, $p < .01$.

Examining Table 11, we can observe that in the case of the grads the majority of the grammatical categories are positive correlated with the hand configuration of signing. Specifically, there are strong positive correlations between the nouns and the straight configuration: $r = .95$, $p < .01$, curved configuration: $r = 96$, $p < .01$ and combined configuration: $r = 94$, $p < .01$; there are correlations between the adjectives and the straight configuration: $r = .92$, $p < .01$, curved configuration: $r = 87$, $p < .01$ and combined configuration: $r = 90$, $p < .01$; there are correlations also between the adverbs and straight configuration: $r = .77$, $p < .01$, curved configuration: $r = 70$, $p < .01$ and combined configuration: $r = 77$, $p < .01$.

Tabelul 9: ***Means (M) and standard deviations (SD) for the iconicity assessment by highschool students and graduate persons according to the grammatical categories and the hand configuration of signing***

Participants' category				
	GRADUATE PERSONS		HIGHSCHOOL STUDENTS	
Dependent variables	*M*	*AS*	*M*	*AS*
Verbs	4.18	.31	4.07	.29
Nouns	3.70	.44	3.46	.48
Pronouns	3.60	.75	2.88	.65
Adjectives	3.25	.72	3.13	.64
Adverbs	3.50	.57	3.52	.56
Prepositions	3.43	.33	4.57	.51
Straight configuration	3.74	.45	3.54	.43
Curved configuration	3.77	.45	3.48	.47
Combined configuration	3.72	.40	3.60	.42

Tabelul 10: ***Correlations between the grammatical categories and hand configuration of signing in the case of thehighschool students***

	Verbs	1	2	3	4	5	6	7	8
1 Nouns	.46**	1	.53**	.85**	.41**	.39**	.97**	.96**	.96**
2 Pronouns	.32	.53**	1	.68**	.36	.18	.52**	.60**	.65**
3 Adjectives	.30	.85**	.68**	1	.44*	.35	.85**	.92**	.84**
4 Adverbs	.13	.41	.36	.44*	1	.51	.45*	.47*	.50*
5 Prepositions	.34	.40	.18	.35	.51**	1	.54*	.35	.43
6 Straight configuration	.55**	.97**	.52*	.85**	.45*	.54*	1	.93**	.94**
7 Curved configuration	.42	.96**	.60**	.92**	.47*	.34	.93**	1	.92**
8 Combined configuration	.51*	.56**	.65**	.84**	.50*	.43	.94**	.92**	1

Note: *$p < .05$; **$p < .01$

Table 11: ***Correlations between the grammatical categories and hand configuration of signing in the case of the graduate persons***

	Verbs	1	2	3	4	5	6	7	8
1 Nouns	.76**	1	.36	.88**	.70**	.48**	.95**	.96*	.94**
2 Pronouns	.28	.36	1	.55**	.74**	.43*	.46*	.35	.50*
3 Adjectives	.75**	.88**	.55**	1	.74**	.54**	.92**	.87**	.90**
4 Adverbs	.71**	.70**	.74**	.74**	1	.56*	.74**	.70**	.77**
5 Prepositions	.34	.48**	.43**	.54**	.56*	1	.57**	.44*	.49*
6 Straight configuration	.83**	.95**	.46*	.92**	.77**	.57**	1	.90**	.85**
7 Curved configuration	.70**	.96**	.35	.87**	.70**	.44*	.90**	1	.89**
8 Combined configuration	.73**	.94**	.50**	.90**	.77**	.49*	.89**	.89**	1

Note: *$p < .05$; **$p < .01$

1.3.4. Discussions

The purpose of this study was to investigate the influence of the age on the assessment of sign iconicity.

Results indicated that there are no significant differences between highschool students and graduated persons in assessing sign iconicity according to the gramatical categories: verbs, nouns, adjectives, adverbs and prepositions. The results indicate that the skills of assessing sign iconicity are manifestated homogenous in the adult years even thou are developed gradually during the anterpreschool years and preschool years (Ormel, Hermans, Knoors & Verhoeven, 2009). Also, there are no significant diferences between the two age groups (mean age 16 and 33.92 years) in the case of hand configuration of signing that can be straight, curved or combined.

The only difference that was statistically significant was in the case of the pronouns assessed by highschool students and graduate persons according to sign iconicity; in this case the graduate persons assessed sign iconicity at a higer lever than the highschool students. The difference that we observed confirms the Hendriks & Spenader (2006) theory according to which in the case of pronouns there is a discrepance between the understanding system and the production system ; many times the undestanding pattern it is developed at a higher level than the production pattern.

The presence of significant positive correlations between all the gramatical categories and the types of signing configurations proves the implication of mutual mechanisms that are the foundation of all these variables. Our results confirm those of Vigliocco, Vinson, Woolfe, Dye & Woll (2005) that studied the mechanisms through which English speakers grouped the signs according iconicity; their results indicated that there is a mechanism by which iconicity overlap and can be generalised (for example in the case of the nouns accompanied by the correspondent verb). These researchers created the theory that the mental imagery is the mechanism that processes the iconicity of the signs. Analysing the correlation matrix in the case of highschool students and the graduate persons, we noticed the tendencie that the graduate persons assess iconicity according to a generalized pattern influenced by previous experiences.

To identify the implications, we can start with Brown's (1977) conclusion that sign ranking by people that do not know Sign language is the most usefull criterium in determinating the iconic value of the signsand in selecting the signs for intervention programs in the communication area. Griffith & Robinson (1980) said that ranking iconicity anticipates which signs are easier to be learned by children. These authors mentioned that sign' learning depends on the paerceptive particularities of the sign and on the subjects' abilities to make associations between the sign and the meaning of it.

The results of this study confirm the hypotheses that there are no significant differences between the highschool students and the graduate persons in the way they assess the sign iconicity, so implicit there are no significant differences determinate by age, being in concordance with Thompson, Vinson şi Vigliocco (2010) who mentioned that there are no evident differences in the way that different age groups assess the sign iconicity.

THE SECOND STUDY: THE EFFICIENCY OF A COMMUNICATION INTERVENTION PROGRAM BASED ON SIGNS AND SYMBOLS

There are only few studies that investigate the efficiency of communication intervention programs which uses signs and symbols in the case of Deafblind / Multisensorial impaired children. Rodbroe & Souriau (2001) emphasize au subliniat that before developing and implementing intervention programs in the communication area, there is a strong need of understanding the efficient communication of Deafblind persons; the ability of a Deafblind child to communicate is much more than the signing skils or the ability of using symbols and involves understanding of the concepts represented by signs and symbols but also the ability to use these linguistic concepts in interactions. The effects of signs and symbols on the behavioural and contextual changes are evident only in the case of dialogues and natural interactions. Without proper ways of communication, the progress of the Deafblind / Multisensorial impaired children, according to the chronological and mental developmental stages, can not reach an optim level, fact that determine the need of creating adequate intervention programs for developing the communication.

In a study that investigated the communication systems of the Deafblind students from American schools, Jensema (1979) named 19 systems used and mentioned that the students prefer the manual systems of communication, including gestures, pantomime and ASL (American Sign Language) but they used also the visual and tactile symbols. In this context we underline the importance of total communication, the use of the tactile way to receive and express messages in the case of the subject without residual ision and the use of visual symbols in the case of the subjects with residual vision. Chen, Downing & Rodriguez (2001) demonstrated the importance of the Tactile Sign Language for the Deafblind students and the usefull combination between the signs and the symbos that can stimulate de development of communication.

In the elaboration of personalized intervention programs for developing the communication specific abilities of Deafblind children it is crucial to take into consideration the expressive and receptive communication skills. This aspect, being a priority in the intervention process, might be the most difficult and can create a lot of troubles for the teachers of Deafblind students. Many times, in the educational practice, the teachers consider the oral and signed language as the only communication systems recognized at the formal level. Considering the limitations of each child, the teachers must choose the proper way of communication and they have to be carefull that the child follows the developmental stages of communication.

In the case of Deafblind children the minimal progress of communication it is not a proof of low cognitive potential, but can be a proof that there is a lack of adapted ways of communication. The specific ways of communicatiom, adapted according to the psychoindividual particularities of the persons, are an evident need for perceiving proper information and if they lack the interactions with other people and with the environment can be affected and diminished. We have to understand that each action can develop the communication and if we diminished the experiences then the interaction will be limited determining a low level of functioning in the environment.

Regarding the lack of studies about intervention programs for developing the communication of Deafblind children, we intend by this study to create and assess a program for developing the communication abilities of Deafblind / Multisensorial impaired children

2. 1. The pilot study

The pilot study intended to process the initial list of signs used as a base for the ***Talking Hands*** intervention program and to clarify the intervention principles to be used in this program. The ***Talking Hands*** intervention program was elaborated for the communication development of the children incuded in this study, as a result of studying the specialized literature and an outcome of the years when the author of this thesis was teacher for Deafblind children. The objectives of this study were (1) to analyze the vocabulary of the four levels included in the intervention program by the specialists who participated in this pilot study and (2) to eliminate from the initial program the signs and symbols that were not relevant for the daily communication that could determine interferences and that had no sign-symbol adequate correspondent.

Participants to this pilot study were four teachers from The Highschool for Visually Impaired Students, Cluj-Napoca with an experience that ranged from 5 to 10 years in aducating and rehabilitating the Deafblind / Multisensorial impaired children and one national trainer in educating the Deafblind / Multisensorial impaired children; the mean experience was $M = 8.4$ ani, ($SD = 2.30$). The participants were all females with the age ranged from 32 to 36 years old ($M = 33.40$ years, $SD = 1.67$), as trainig : there were a special education teacher, an educator, a psychologist and a corrective-compensatory therapist, all being familiar with the students included in the ***Talking Hands*** program.

Procedure:
The pilot study was realized in individual sessions, of about 20 minutes each. In the beginning, the teachers received information about the intervention program, the working tasks and then they were asked to eliminate the signs and the symbols that from their perspective do not have relevance for the childred involved in the study and also to remove the items that can interfere with diffrent aspects of their learning process. The responses were written, marking also the affirmations about several signs and symbols from the intervention program and about the intervention principles.

***Research Instruments*:**
In this pilot study we used the *Initial intervention program* that has 153 signs-symbols items, structured on four levels; it was elaborated starting from the Makaton Vocabulary (Walker, 1980) descibed in the 2.7.2. of this thesis.

Results:
The qualitative analyze of the participants' responses determined the elimination of 14 items from the initial program of intervention as follows:

- The item **WHERE** represents a concept that can easier be express by the facial intergogative expressions (taking into account that all the students from the program have residual vision, we decided to delete it from the list);
- The symbol and the sign for **WHAT** are very abstract, and the Deafblind / Multisensorial impaired students need iconic symbols and signs for facilitating their learning process (c.f. Griffith & Robinson, 1980);
- The items **HERE** and **THERE** represent concepts that are easier expressed by the indicative naturat gestuare showed by the indicative finger. The participants precised that is difficult to give a precise semnification to these simbols;
- The symbol for **TO LOOK** does not correspond with the sign, so we eliminate it from the program for not to appear interferences;

- The item **NURSE** was exluded from the initial list because at the same level thete was the *doctor* represented in a similar way and the participants in the study said that could cause confussions;
- Analysing the sign for **MAN we concluded that is almost identic to the sign for** father *and similar to the sign for boy*, so to evit interferences we decided to eliminate it from the intervention program;
- The sign for **WOMAN** is abstract and taking into consideration that in the program we had the sign for *girl* we decided to keep the *girl* item;
- Analysing the item **LAMP** we came to the conclusion that the utility level of this item is very low and the sign is ambiguous, so we exluded it from the intervention program;
- The symbol for **AND** is very abstract and there is no sign for it, but is fingerspelt by *Ş* and *I* in the romanian dactyl alphabet; taking into account also that in the signed communication this item is not much used, we decided to delete it from the second level of the program;
- The symbol for the verb **TO HAVE** is different from the correspondent sign and for avoiding interferations we exluded it;
- For the Deafblind / Multisensorial impaired students, the verb **TO DIG** is not relevant, therefore we deleted it and we focused on more usefull concepts;
- Taking into consideration that the majority of the participants to this study were girls, the item **TO SHAVE** has no evident utility and we conclude that we do not need to teach it in the context of this intervention program;
- The combination of elements from the symbol for OUTSIDE is ambiguous, complex, can not easily be decodified and do not have similar elements with the correspondent sign that is why we excluded it from the intervention program;

Discussions

The ***Talking Hands*** intervention program, elaborated for this study was processed together with the specialists with experience in educating the Deafblind / Multisensorial impaired children to assure an adequate structure and proper intervention principles.

The intervention principles extracted from the discussions with the participants are summarized as follows:

The process of teaching and learning must be dynamic realized bu using interactive strategies, concrete objects and examples from the daily routine. The multiple repetition of the concept included in the intervention programs is needed in the case of Deafblind / Multisensorial impaired children and have to focus the intervention on the functional aspects of the concepts. The final aim is the children to use the signs and the symbols from the ***Talking Hands*** intervention program and to develop their independence level by increasing the expressive and receptive communication.

The signing has to be adapted to the visual potential of the child and if the tactile way is needed, the sign have to be signed by the child perspective. The teachers and the pupils must have confortable positions to be able to sign correcley; the teacher's position can vary: behind, on a side or in the front of the child. The most important thing is the signs to be signed from the child's perspective, using the dominant child's hand as the main hand in the signing process. The manipulation of the child hand is important in signing the signs that need tactile adaptations. The child has to be encouraged to touch the teacher's hand at the

beginning to receive better all the parameters involved in signing. There has to be an increased attention on the acquisition of the expressive form if the signs and symbols that already exist in the receptive vocabulary of the child. While the coactive signing, the teacher has to explain the items used and has to take into the ccount that the children have problems of the visual-motor coordination.

The use of symbols can be generalized at the level of school or extraschool activities because the child can use the symbol card of the learned concepts in daily activities, for example in negociation of the calendar daily activities. The adaptation of the showing distance of the symbol has to be made according to the child visual potential assessed at the beginning of the intervention program.

Communication through Sign Language must be consistent, all the persons fro the child environment to use the same signs. Signing will involved all the children with residual vision to receive all the parameters of the signs: hand configuration, direction, orientation and placement of the sign. The child must be helped to understand the reciprocity in the communicational process between the transmitter and receiver; he has to learn that when he perceive a sign, actually he receive a message and that the other partner of the conversation is waiting his answers.

The expressive and receptive language has to be based on experiences from pleasant activities and from the dialogues during the activities. The child needs repeated oprtunities to be involved in reciprocal interactions in activities as: role play, signs and symbols identification, recognition of particular signs from several signs, recognition of symbols from symbols aleatory presentation, practical activities of exercising signs and symbols in daily activities.

Encouragement and rewards must be permanent to determine the change of the extrinsic motivation into intrinsic motivation, which is very important in the learning process of every student and especially of Deafblind / Multisensorial impaired students. All the child's attempts to use the signs and symbols learned in the intervention program should be appreciated and rewarded. It is very important to observe the child's reactions in co-active signing and has to be systematic to monitor and to find the moment in which to give less physical support and when the child is able to sign in the right way the movements of the sign.

2. 2. The main study

2.2.1. Aim and hypotheses

This study investigates the efficiency of the ***Talking Hands*** intervention program on communication, based on signs and symbols used in the case of Deafblind / Multisensorial impaired children. The study starts with the hypothesis that the students who are involed in the ***Talking Hands*** intervention program will learn more skills of expressive and receptive communication by signs and symbols at the end of the program and at the one month follow-up assessment compairing to the skills registred at the beginning of the intervention program.

The hypotheses of the study were:

1) Shall be presumed that there are significant differences in the phases of pre-intervention, post-intervention and follow – up regarding the learning of the signs.

2) Shall be presumed that there are significant differences in the phases of pre-intervention, post-intervention and follow – up regarding the learning of the symbols.

3) Shall be presumed that there are significant correlations between the cognitive development, receptive communication, expressive communication, representational and symbolic abilities, reciprocity, interaction with adults, with children and with the environment in the case of the Deafblind / Multisensorial impaired children included in this study.

2.2.2. Method

The research had a pre-post-follow-up comparative design. The participants were assessed before the intervention program (Pre-test), after the intervention (Post-test) and at follow-up assessment after one month from the end of the intervention program (FF). The independent variable is represented by the administration of the ***Talking Hands*** intervention program implemented by the author of this thesis. The dependent variables are the grammatical categories and the hand configuration of signing the items included in the intervention program.

2.2.2.1. Participants

In this study participated 7 students: 3 girls and 4 boys with age ranged from 11 years and 2 months to 18 years and 8 months (M = 14.94, SD = 2.57). These are Deafblind / Multisensorial impaired students from the Highschool for Visually Impaired Students, Cluj-Napoca. The criterium of selection was that the students had to present significant discrepance between the chronologic age and the age of receptive and expressive communication. Initially there were 9 participants in the study but because of absenteeism during the program implementation, the results of two students were eliminated from the final analyze.

In the following part we will describe each of the participants to understand better the participant's sample incuded in this study.

R.F. is 13 years old, he was born on 21.01.1999 in Sibiu and he has Usher Sindrom, having retinita pigmentosa, medium hypermetropia, neurosensorial bilateral hearing loss and mental disorder. According to the assessment with the Callier-Azusa G & H Scales, he has the following values: cognitive development: 6 years, receptive communication: 4 years, expressive communication: 3 years and 10 months, representational and symbolic abilities: 2 years, reciprocity: 1 year and 4 months, interaction with adults: 2 years, interaction with peers: 6 years and interaction with the environment: 5 years. R.F uses to communicate the Sign Language, shows hyperactivity and is losing quickly his interest for the activity he is involved in. He likes to be in charge of some responsabilities about other children or adults. He is very independent in the familiar places, realizing by himself the tasks he is given if the requests are expressed in a simple and proper way; he understands quickly various tasks. He is frustrated sometimes because he is not well understood by the others who do not sign and this fact sometimes causes aggressive behaviors. R.F receives medical treatment for reducing the aggressive behavior and the hyperactivity.

S.M. is 17 years old, she was born on 1.04.1995 in Feleac, Cluj County and presents convergent squint, astigmatism, moderat mental disorder and severe delay in the language development. According to the assessment with the Callier-Azusa G & H Scales, she has the following values: cognitive development: 4 years and 5 months, receptive communication: 4 years, expressive communication: 1 year and 10 months, representational and symbolic abilities: 1 year and 4 months, reciprocity: 1 year, interaction with adults: 2 years and 2 months, interaction with peers: 3 years and 8 months and interaction with the environment: 3 years and 4 months. She can not use complex words in the communication, only sounds and syllables, fact that determine a difficult communication with the children and adults around her. She has no autoprotection skills and she is very easy influenced; she shows protective behaviors for younger children around her and demonstrates a strong will of communication creating some specific vocal expressions and personalized signs.

C.V. is 12 years old, she is born on 6.10.2000 and presents posterior cataract, colobom iridian, microftalmie, neurosenzorială medium hearing loss, and mental disorder. According to the assessment with the Callier-Azusa G & H Scales, she has the following values: cognitive development: 3 years and 7 months, receptive communication: 3 years and 9 months, expressive communication: 3 years, representational and symbolic abilities: 2 years, reciprocity: 1 year and 4 months, interaction with adults: 2 years and 2 months, interaction with peers: 4 years and interaction with the environment: 5 years and 9 months. C.V. shows hyperactivisty traces, finishing hardly the tasks she is given, she needs brakes during activities and a lot of requirements repetitions. She is able to establish quickly relationships with the

adults and she likes to be involved in activities with younger children to whom she has a protective behavior; she involves them in role play similar to the adults model.

P.N. şi ***B.N.*** are 16 years old, they are twin brothers born on 17.05.1996 in Şieu, Maramureş County in a well organisad family. **P.N.** presents squint and severe mental disorder. According to the assessment with the Callier-Azusa G & H Scales, he has the following values: cognitive development: 3 years, receptive communication: 3 years, expressive communication: 1 year and 4 months, representational and symbolic abilities: 1 year and two months, reciprocity: 1 year, interaction with adults: 2 years, interaction with peers: 3 years and 4 months and interaction with the environment: 3 years. **B.N.** presents squint and severe mental disorder. According to the assessment with the Callier-Azusa G & H Scales, he has the following values: cognitive development: 3 years, receptive communication: 3 years, expressive communication: 1 year and 5 months, representational and symbolic abilities: 1 year and 3 months, reciprocity: 1 year, interaction with adults: 2 years, interaction with peers: 3 years and 5 months and interaction with the environment: 3 years. The communication between the twin brothers is based on natural signs and specific vocalisations created by them. They have a high level of daily living skills and they succeed in the tasks that are solved in paire. They prove to have a low oculo-motor coordonation and they are spastic.

M.I. is 15 years old, he is born on 31.08.1997 in Chichiş, Covasna County and presents convergent squint, afakie, nistagmus, infantile encephalopathy and challenging behaviour. According to the assessment with the Callier-Azusa G & H Scales, he has the following values: cognitive development: 5 years and 7 months, receptive communication: 4 years and 5 months, expressive communication: 4 years, representational and symbolic abilities: 2 years, reciprocity: 1 year and 4 months, interaction with adults: 2 years and 2 months, interaction with peers: 6 years and interaction with the environment: 6 years. Presently he lives in a placement centre from Covasna and he keeps the relationship with his father and his grandmother with whom he spents part of his holydays.

M.B. is 19 years old, born on 10.05.1993 in Sighetul-Marmaţiei, Maramureş County and she presents at the left eye - iridian coloboma, microftalmia and at the right eye - sclerocornee, convergent squint; mental disorder and challenging behaviors. According to the assessment with the Callier-Azusa G & H Scales, she has the following values: cognitive development: 8 years, receptive communication: 9 years, expressive communication: 8 years and 10 months, representational and symbolic abilities: 2 years, reciprocity: 1 year and 4 months, interaction with adults: 2 years and 4 months, interaction with peers: 6 years and interaction with the environment: 6 years. She shows speech difficulties because of rinolalia and adenoid vegetations. She is under medical treatment to reduce the aggression and she benefits of behavioral therapy. She is independent in the familiar places but is very anxious in new places asking all the time the presence of an adult person. She likes to succeed in the tasks she is involved in; if she fails then she stops the activity and she reject it also in the future. She waits rewards after all the tasks in which she succeeds.

2.2.2.2. Procedure

This study was accomplished in 22 sessions of about 30 minutes each, covering the ***Talking Hands*** intervention program created for Deafblind / Multisensorial impaired students. Previous the intervention we assessed the participants using the Callier-Azusa G Scales (described in the chapter 2.8.1. of the present thesis) on Cognitive development, Receptive communication, Expressive communication, Social development: interactions with adults, interactions with same age children, interactions in the environment; the students were assessed also by the Callier-Azusa H (described in the chapter 2.8.2. of the present thesis) on Representational and symbolic abilities and Reciprocity. Before the intervention we made the preintervention assessment (January 2012) using the Assessment of Makaton Vocabulary (AMV) - Birkett, 1984. The assessment on the way was realized by the assessment sheets for each level of the program. At the end of the intervention program we made the postintervention assessment (April 2012) and after one month we made the follow-up

assessment (May 2012) using the AMV assessment tool. The assessments were made by the author of this thesis together with the psychologist V.M. who is also a teacher of the students included in the intervention program.

The sessions were video recorded and included all the items from the four levels of the ***Talking Hands*** program.

2.2.2.3. Research instruments

In this srudy we used for the pre-intervention, post-intervention and follow-up assessments the following instruments:

- Callier-Azusa G Scale (with the subscales: Cognitive Development, Receptive Communication, Expressive Communication, Social Development: interactions with adults, interactions with peers and interaction with the environment and Callier-Azusa H Scale (with the subscales: Representational and symbolic abilities and Reciprocity (described in the chapters 2.8.1. and 2.8.2.of the thesis in the extended version)

- The Assessment of Makaton Vocabulary includes 141 items organised 3 subcategories: oral expressive answers, signed answers and understanding the symbols. This instrument was elaborated by Eleanor Birkett in 1984; it was translated and adapted into Romanian by the author of this thesis with the purpose of realizing the pre-intervention, post-intervention and follow-up assessments.

- The assessment sheets for each level of the ***Talking Hands*** program included the assessment of every item of the intervention program organized as follows: expressive communication: signs / symbols and receptive communication: signs / symbols.

- In this study we used in the intervention the ***Talking Hands*** program, elaborated especially for this study based on the Makaton Core Vocabulary (Walker 1980). The program has 137 items, organized on four levels. The symbols that we used were selected with the help of the software: PCS Boardmaker™ Plus! © Mayer-Johnson.

2.2.3. Results

At the beginning we analyze the internal consistency of the items from the assessment instrument: Assessment of Makaton Vocabulary. The internal consistency refers to the unuiformity of the way in which the test items measure the same variable, being a prerequisite of validity.High scores of the internal consistency shows that the items ate strongly correlated and circumcise the same variable.

The *Alpha Cronbach* coefficients of the AMV assessment instrument are: $\alpha = .98$ for the oral answers – pre-intervention, $\alpha = .97$ for signed answers – pre-intervention, $\alpha = .95$ for understanding the symbols – pre-intervention, $\alpha = .98$ for the oral answers – post-intervention, $\alpha = .82$ for signed answers – post-intervention, $\alpha = .75$ for understanding the symbols – post-intervention, $\alpha = .98$ the oral answers – follow-up, $\alpha = .82$ for signed answers – follow-up, $\alpha = .80$ for understanding the symbols – follow-up. Examining the data we can say that the assessment instrument that we used in this study presents a high level of internal consistency.

To investigate the efficiency of the ***Talking Hands*** intervention program on the development of communication skills of Deafblind / Multisensorial impaired children, we uses ANOVA with repeated measures because we were interested in investigating the difference between the communication abilities assessed in the pre-intervention, post-intervention and follow-up phases. ANOVA with repeated measures had a variance factors

the pre-intervention, post-intervention and follow-up phases. The Dependent variables were the oral language, the Sign language and the symbols, but also the hand configuration of signing (straight, curved and combined). A significance level of .05 was used.

Means and standars deviations for the dependent variables in the pre-intervention, post-intervention and follow-up phases are presented in the Table 12 and the Figures 21, 22 and 23 ilustrate the results obtained in the pre-intervention, post-intervention and follow-up phases in the case if oral language, signs and symbols.

The data were processed by the SPSS statistic program, using ANOVA with repeated measures because we wanted to know if there is a difference between the pre-intervention, post-intervention and follow-up assessments of the children included in the intervention program.

ANOVA with repeated measures revealed significant differences between the students' results in pre-intervention, post-intervention and follow-up phases regarding the ***Sign language***. In this case, the Mauchly test: $\chi^2(2) = .12$, $p < .05$, and $F(1,6) = 155{,}98$, $p < .001$, $\eta^2 = .96$ indicate that the sphericity is not assumed so we applied the Bonferoni correction. The contrasts revealed that there are significant differences between the students' results from the pre-intervention phase and the follow-up phase: $F(1,6) = 74{,}43$, $p < .001$, $\eta^2 = .93$; as well, there are significant differences between the students results from the post-intervention phase and the follow-up phase: $F(1,6) = 29{,}72$, $p < .01$, $\eta^2 = .83$.

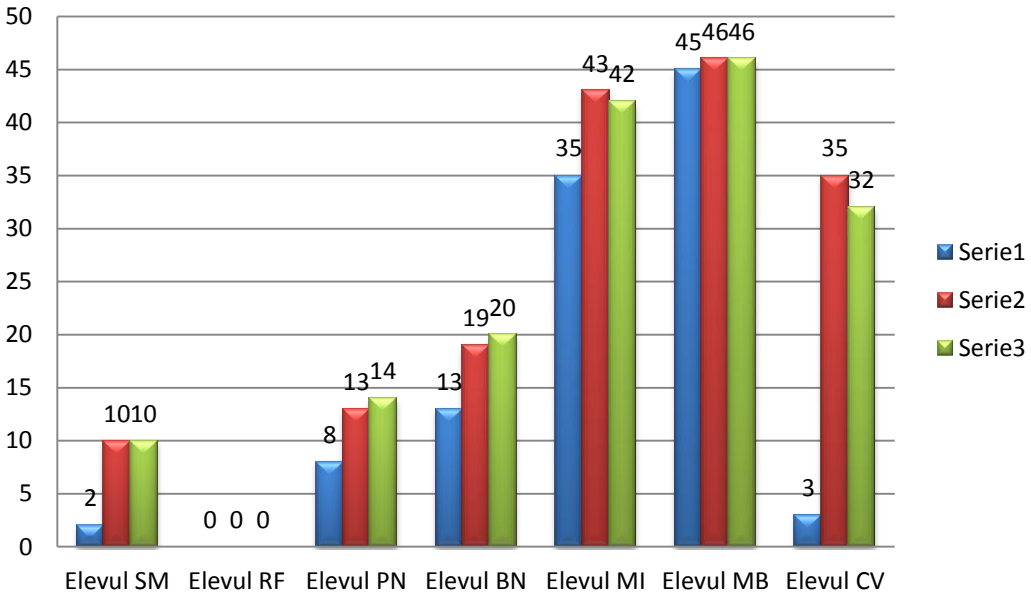
Also, ANOVA with repeated measures revealed significant differences between the students' results in pre-intervention, post-intervention and follow-up phases regarding the ***symbols***. In this case, the Mauchly test $\chi^2(2) = .58$, $p > .05$, and $F(1,6) = 174{,}87$, $p < .001$, $\eta^2 = .97$ indicate the assuming of the sphericity. The contrasts revealed that there are significant differences between the students' results from the pre-intervention phase and the follow-up phase: $F(1,6) = 19{,}89$, $p < .01$, $\eta^2 = .77$; as well, there are significant differences between the students results from the post-intervention phase and the follow-up phase: $F(1,6) = 4{,}30$, $p < .05$, $\eta^2 = .42$.

Regarding the ***oral language***, ANOVA with repeated measures did not revealed significant differences between the students' results from the pre-intervention, post-intervention and follow-up phases. In this case, the Mauchly test: $\chi^2(2) = 20{,}47$, $p < .05$ and $F(1,6) = 10{,}63$, $p < .05$, $\eta^2 = .63$ indicate that the sphericity is not assumed so we applied the Bonferoni correction. The contrasts revealed that there are not significant differences between the students' results from the pre-intervention phase and the follow-up phase: $F(1,6) = 5{,}15$, $p > .05$, $\eta^2 = .46$; as well, the contrasts show that there are not significant differences between the students results from the post-intervention phase and the follow-up phase: $F(1,6) = .30$, $p > .05$, $\eta^2 = .04$.

Table 12: ***Descriptive of the dependent variables on the phases of pre-intervention, post-intervention and follow-up according to the type of language assessed***

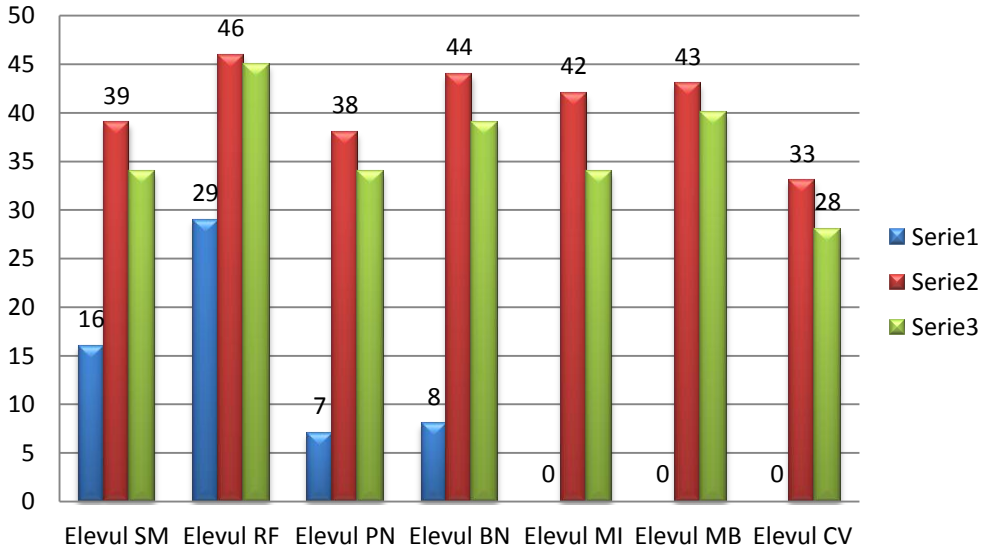
	Pre-intervention assessment		Post-intervention assessment		Follow-up assessment	
Dependent variables	*M*	*SD*	*M*	*SD*	*M*	*SD*
Oral language	15.14	17.72	23.71	17.72	23.43	17.11
Sign language	8.57	10.77	40.71	4.34	36.28	5.50
Symbols	28.71	11.77	43.43	3.26	39.00	8.16

Figure 21: Results of the pre-intervention, post-intervention and follow-up assessments of the oral language



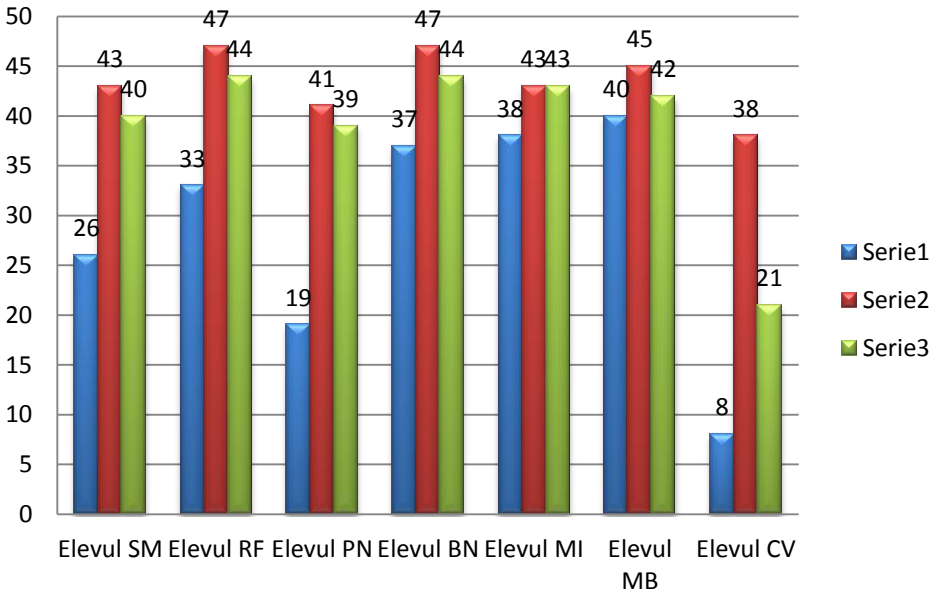
Serie 1 – pre-intervention, Serie 2 – post-intervention, Serie 3 – follow-up

Figure 22: Results of the pre-intervention, post-intervention and follow-up assessments of the Sign Language



Serie 1 – pre-intervention, Serie 2 – post-intervention, Serie 3 – follow-up

Figure 23: Results of the pre-intervention, post-intervention and follow-up assessments of the symbols



Serie 1 – pre-intervention, Serie 2 – post-intervention, Serie 3 – follow-up

Means and standard deviations for the dependent variables: straight configuration, curved configuration and combined configuration on the pre-intervention, post-intervention and follow-up phases ate presented by Table 13, and the Figures 24, 25 and 26 ilustrate the results obtained in the pre-intervention, post-intervention and follow-up phases accordin to the hand configuration of signing.

ANOVA with repeated measures revealed significant differences between the students' results in pre-intervention, post-intervention and follow-up phases regarding the ***straight configuration.*** In this case the Mauchly test: $\chi^2(2) = .25$, $p < .05$, and $F(1,6) = 130,12$, $p < .001$ indicate that the sphericity is not assumed so we applied the Bonferoni correction. The contrasts revealed that there are significant differences between the students' results from the pre-intervention phase and the follow-up phase: $F(1,6) = 21,84$, $p < .01$, $\eta^2 = .78$; as well, there are significant differences between the students results from the post-intervention phase and the follow-up phase: $F(1,6) = 7,08$, $p < .05$, $\eta^2 = .54$.

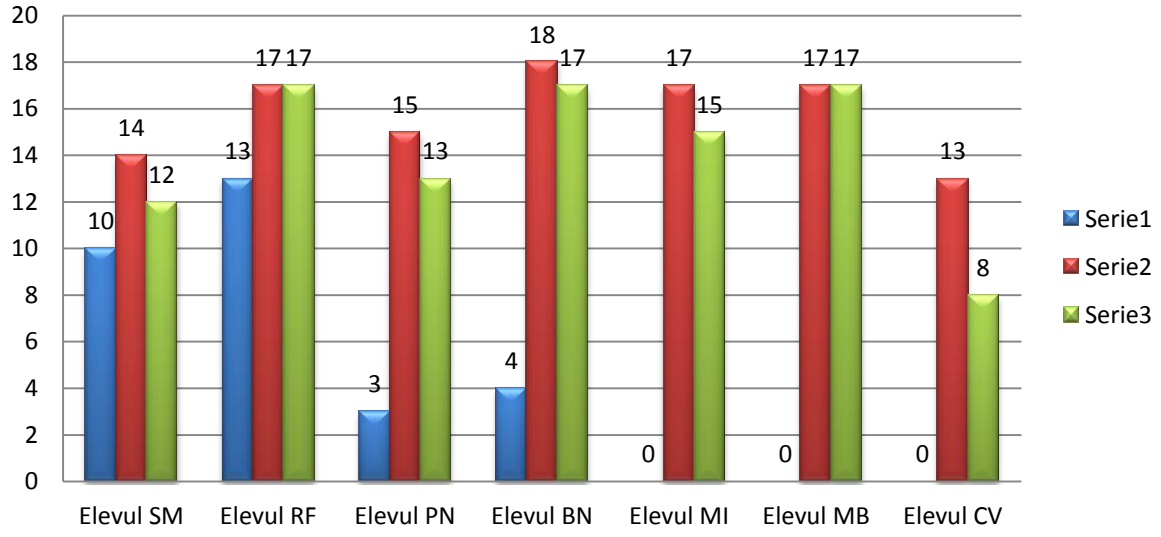
ANOVA with repeated measures revealed significant differences between the students' results in pre-intervention, post-intervention and follow-up phases regarding the ***curved configuration.*** In this case the Mauchly test: $\chi^2 (2) = .25$, $p < .05$, and $F(1,6) = 95,26$, $p < .001$ indicate that the sphericity is not assumed so we applied the Bonferoni correction. The contrasts revealed that there are significant differences between the students' results from the pre-intervention phase and the follow-up phase: $F (1,6) = 55,33$, $p < .001$, $\eta^2 = .90$; as well, there are significant differences between the students results from the post-intervention phase and the follow-up phase: $F(1,6) = 13,34$, $p < .01$, $\eta^2 = .69$.

ANOVA with repeated measures revealed significant differences between the students' results in pre-intervention, post-intervention and follow-up phases regarding the ***curved configuration.*** In this case the Mauchly test: $\chi^2(2) = .80$, $p > .05$, and $F(1,6) = 97,86$, $p < .001$ indicate the assuming of sphericity. The contrasts revealed that there are significant differences between the students' results from the pre-intervention phase and the follow-up phase:$F(1,6) = 86,88$, $p < .001$, $\eta^2 = .93$; as well, there are significant differences between the students results from the post-intervention phase and the follow-up phase: $F(1,6) = 14,00$, $p < .01$, $\eta^2 = .70$.

Table 13: ***Descriptive of the dependent variables on the phases of pre-intervention, post-intervention and follow-up according to the hand configuration of signing***

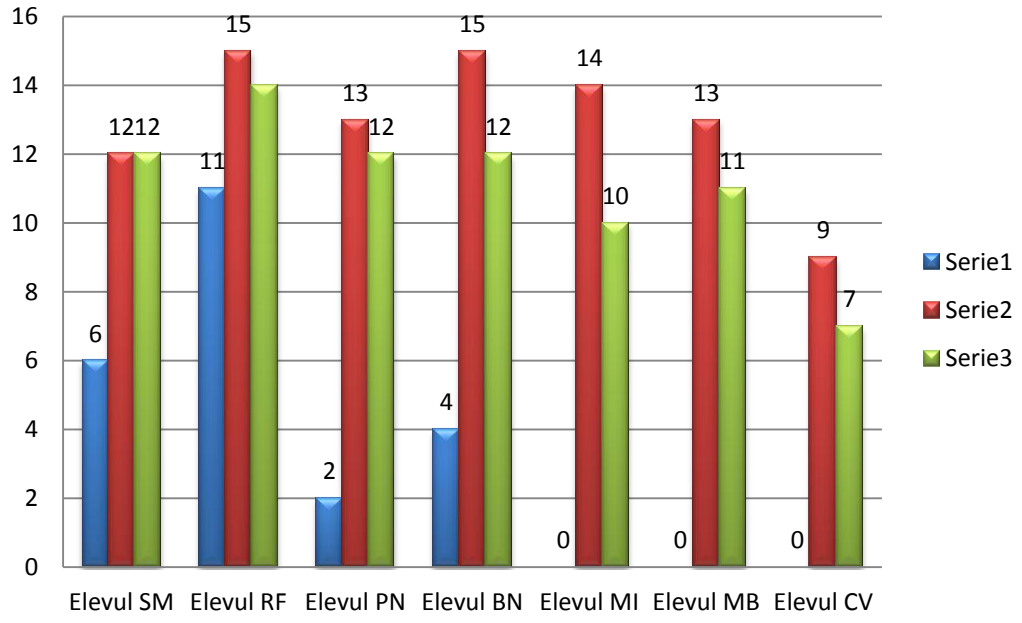
	Pre-intervention assessment		Post-intervention assessment		Follow-up assessment	
Dependent variables	*M*	*SD*	*M*	*SD*	*M*	*SD*
Straight configuration	4.28	5.25	15.86	1.86	14.14	3.39
Curved configuration	3.28	4.11	13.00	2.08	11.14	2.19
Combined configuration	1.86	2.99	11.43	1.40	9.43	2.23

Figure 24: Results of the pre-intervention, post-intervention and follow-up assessments of the signs with straight configuration



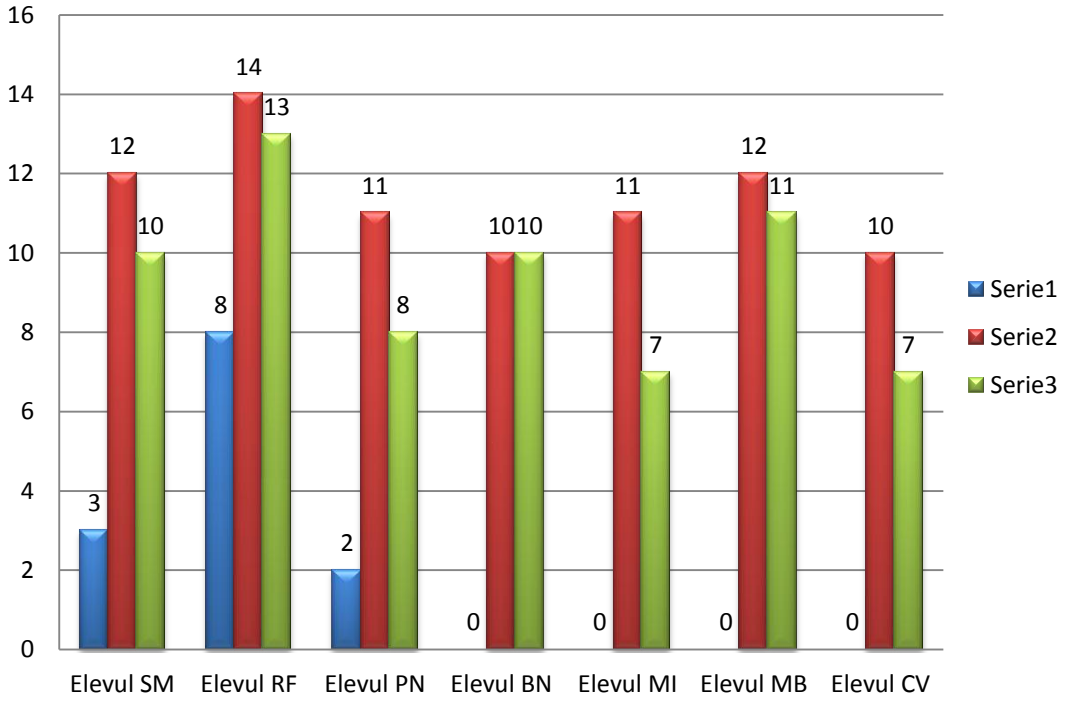
Serie 1 – pre-intervention, Serie 2 – post-intervention, Serie 3 – follow-up

Figure 25: Results of the pre-intervention, post-intervention and follow-up assessments of the signs with curved configuration



Serie 1 – pre-intervention, Serie 2 – post-intervention, Serie 3 – follow-up

Figure26: Results of the pre-intervention, post-intervention and follow-up assessments of the signs with combined configuration



Serie 1 – pre-intervention, Serie 2 – post-intervention, Serie 3 – follow-up

For analysing the data assessed at each level of the program from the perspective of expressive and receptive communication we used the *t* test for independent samples and for calculating the effect size we used the Cohen *d* indicator. A significance level of .05 was used. The dependent variables were the grammatical categories of the signs: verbs, nouns, pronouns, adjectives, adverbs, prepositions and the hand configuration of signing (straight, curved and combined).

The independent *t* test between the expressive communication and the receptive communication did not revealed significant differences at the first and third level of the program between the results of sign assessment from the expressive and receptive communication's perspective. At the second level we noticed one significant difference between the expressive communication and the receptive communication in the case of the curved hand configuration of signing: $t(6) = 2.44$, $p < .05$, $d = .92$.

Regarding the fourth level of the ***Talking Hands*** program, the *t* test revealed significant differences between the expressive communication and the receptive communication in the case if the nouns: $t(6) = 2.80$, $p < .05$, $d = 1.06$; in the case of the verbs: $t(6) = 3.17$, $p < .05$, $d = 1.19$; in the case of prepositions: $t(6) = 3.67$, $p < .01$, $d = 1.38$; in the case of the straight configuration of signing: $t(6) = 4.27$, $p < .01$, $d = 1.61$; in the case of the combined configuration of signing: $t(6) = 3.01$, $p < .05$, $d = 1.14$; in the case of the verbs expressed through symbols: $t(6) = 2.54$, $p < .05$, $d = .96$.

Another aspect that interested us was to see if there are correlations between the expressive communication and the receptive communication. At the second level of the program we noticed positive correlations between the expressive communication and the receptive communication in the case of the nouns expressed by signs: $r = .80$, $p < .05$ and in the case of the adjectives expressed by signs: $r = 82$, $p < .05$.

At the third level we there were positive correlations between the expressive communication and the receptive communication in the case of the verbs expressed by signs: $r = .87$, $p < .05$ and in the case of the signed expressions: $r = 87$, $p < .05$; at this level we had also correlations between the expressive communication and the receptive communication in the case of the nouns expressed by symbols: $r = .87$, $p < .01$, verbs expressed by symbols: $r = .88$, $p < .01$ and in the case of the expressions communicated through symbols: $r = .79$, $p < .05$.

We observed that at the fourth level there were more correlations between the expressive communication and the receptive communication; for example, there are significant correlation in the case of the nouns expressed by signs: $r = .76$, $p < .05$; verbs expressed by signs: $r = .98$, $p < .001$; pronouns expressed by signs: $r = .88$, $p < .01$; prepositions expressed by signs: $r = .81$, $p < .05$; straight signing configuration: $r = .78$, $p < .05$; curved signing configuration: $r = .96$, $p < .001$; combined signing configuration: $r = .97$, $p < .001$; at the same level there were correlation between the expressive communication and the receptive communication in the case of nouns expressed by symbols: $r = .89$, $p < .01$; verbs expressed by symbols: $r = .99$, $p < .001$; pronouns expressed by symbols: $r = .98$, $p < .001$; prepositions expressed by symbols: $r = .85$, $p < .01$.

Table 14 : ***Means (M) and standard deviations (SD) of the signs assessment from the first level of the Talking Hands program***

FIRST LEVEL	Expressive communication		Receptive communication	
	M	*SD*	*M*	*SD*
Nouns	2.43	.53	2.68	.20
Verbs	2.46	.51	2.59	.26
Pronouns	3.00	.00	2.93	.19
Adjectives	1.57	1.06	1.29	.86
Adverbs	2.64	.48	2.71	.76
Expressions	2.82	.47	2.93	.12
Straight configuration	2.61	.41	2.71	.17
Curved configuration	2.55	.39	2.51	.23
Combined configuration	2.20	.53	2.54	.32

Table 15: ***Means (M) and standard deviations (SD) of the signs assessment from the second level of the Talking Hands program***

SECOND LEVEL	Expressive communication		Receptive communication	
	M	*SD*	*M*	*SD*
Nouns	2.02	.53	2.30	.47
Adjectives	1.61	.69	1.93	.49
Straight configuration	2.13	.35	2.29	.36
Curved configuration	2.01	.58	2.41	.50
Combined configuration	1.82	.57	2.11	.60

Table 16: ***Means (M) and standard deviations (SD) of the signs assessment from the third level of the Talking Hands program***

THIRD LEVEL	Expressive communication		Receptive communication	
	M	*SD*	*M*	*SD*
Nouns	2.37	.51	2.55	.40
Verbs	3.65	.53	2.60	.45
Pronouns	3.00	.00	2.86	.38
Adjectives	2.57	.53	2.71	.49
Prepositions	3.00	.00	2.85	.38
Expressions	1.43	.98	1.57	.98
Straight configuration	2.67	.39	2.65	.42
Curved configuration	2.51	.31	2.66	.35
Combined configuration	2.43	.40	2.50	.45

Table 17: ***Means (M) and standard deviations (SD) of the signs assessment from the fourth level of the Talking Hands program***

FOURTH LEVEL	Expressive communication		Receptive communication	
	M	*SD*	*M*	*SD*
Nouns	2.43	.36	2.67	.27
Verbs	2.37	.54	2.54	.45
Pronouns	2.09	.63	2.62	.41
Prepositions	2.09	.63	2.62	.41
Straight configuration	2.27	.36	2.64	.24
Curved configuration	2.54	.51	2.60	.47
Combined configuration	2.37	.51	2.55	.38

Table 18: ***Means (M) and standard deviations (SD) of the symbols assessment from the first level of the Talking Hands program***

FIRST LEVEL	Expressive communication		Receptive communication	
	M	*SD*	*M*	*SD*
Nouns	2.61	.17	2.77	.15
Verbs	2.66	.29	2.70	.35
Pronouns	2.14	.69	2.50	.76
Adjectives	2.00	.96	2.14	.94
Adverbs	2.89	1.11	2.43	.79
Expressions	2.71	.42	2.79	.22

Table 19: ***Means (M) and standard deviations (SD) of the symbols assessment from the second level of the Talking Hands program***

SECOND LEVEL	Expressive communication		Receptive communication	
	M	*SD*	*M*	*SD*
Nouns	2.55	.52	2.66	.25
Adjectives	2.39	.91	2.68	.49

Table 20: ***Means (M) and standard deviations (SD) of the symbols assessment from the third level of the Talking Hands program***

THIRD LEVEL	Expressive communication		Receptive communication	
	M	*SD*	*M*	*SD*
Nouns	2.70	.33	2.86	.13
Verbs	2.54	.61	2.59	.55
Pronouns	2.71	.49	2.71	.49
Adjectives	2.50	.50	2.50	.50
Prepositions	2.93	.19	2.93	.19
Expressions	2.14	.69	2.43	.79

Table 21: ***Means (M) and standard deviations (SD) of the symbols assessment from the fourth level of the Talking Hands program***

FOURTH LEVEL	Expressive communication		Receptive communication	
	M	*SD*	*M*	*SD*
Nouns	2.60	.40	2.72	.30
Verbs	2.44	.49	2.57	.37
Pronouns	2.57	.93	2.64	.94
Prepositions	2.33	.54	2.33	.54

2.2.4. Discussions

The aim of this study was to investigate the efficiency of the ***Talking Hands*** intervention program on the communication abilities, based on signs and symbols used in the case of Deafblind / Multisensorial impaired children.

The data evidentiated the efficiency of the ***Talking Hands*** intervention program for Deafblind / Multisensorial impaired children. The results prove that the intervention program determined a meaningful improvement of the expressive and receptive communication through signs and symbols in the case of the Deafblind / Multisensorial impaired children especially in the post-intervention phase. The intervention's effect sizes were high, so we can underline that this kind of intervention had a strong effect on the development of expressive and receptive communication.

Therefore, we remark evident positive effects of the ***Talking Hands*** intervention program because there are significant differences between the the pre-intervention, post-intervention and follow-up phase regarding the acquisition of signs and symbols by the children involved in the program.

The progress induced by the implementation of the intervention program is evident especially in the post-intervention phase because in the follow-up we recorded a small regress. Our results confirm once more this pattern evidentiated also by Stillman & Battle (1986).

The results that we obtain analyzing the talking Hands levels indicated that there are significant differences between the expressive communication and receptive communication particularly at the second and at the fourth level because in these cases the students presented a better receptive communication. The Cohen *d* indicator showed high sizes of the effect, so the students had a better receptive communication on signed communication and also on the communication through symbols. These results confirm what Rowland & Stremel-Campbell (1987) underlined, that the Deafblind / Multisensorial impaired students have a better receptive communication then expressive communication.

Conclusively, we can express the following aspects regarding the efficiency of the Talking hand intervention program addressed to the Deafblind / Multisensorial impaired students for developing their communicational abilities: (1) this is one of the first Romanian studies on the implementation of a program for developing Deafblind / Multisensorial impaired students communicational abilities; (2) the short-term results (at the end of the program implementation) sustain the efficiency of this program on the expressive and receptive communication through signs and symbols.; (3) the long-term results (after closing the program) maintain the effects on some of the variables.

THE THIRD STUDY: COMMUNICATION OF DEAFBLIND ADULTS FROM THE PRAGMATIC PERSPECTIVE

The Deafblind persons present an evident heterogeneity from the communication perspective and because of this we considered usefully to realize a qualitative study focused on the pragmatic aspects of the communication selected from investigating the daily communication in the social context. This perspective builds up linguistic assessments and directs the following interventions towards significant objectives for the Deafblind person's experiences as communication agents.

The assessment of the pragmatic aspects of language proves to be a challenge because of many reasons related to pragmatics. Lesser & Milroy (1993) mention the lack of adequate instruments in the assessment of pragmatic and underline that the main reason for this is the varied and controversialist nature of the knowledge about pragmatics. Despite the difficulties, some assessment procedures were elaborated especially for adults with aphasia and learning difficulties (van der Gaag and Dormandy, 1993).

Manochioping, Sheard & Reed (1992), identified five assessments' approaches: (1) observing communicative interactions for the presence of a range of verbal and nonverbal communicative acts and rating them for appropriateness (Skinner, 1984; Prutting & Kirchner, 1987); (2) observing and coding the efficiency of a person's communication in various situations (Sarno, 1965; Lomas, 1989); (3) measuring communicative success in a standardised procedure involving role-playing tasks (Holland, 1980); (4) investigation involving the family concerning the person's communicative style and needs (Florance, 1981; Holland, 1982; Webster, 1982); (5) composite approaches that use several of the above techniques (Penn, 1988; Gerber & Gurland, 1989; Wirz, Skinner & Dean, 1990). Lesser and Milroy (1993) have presented an approach to the investigation of conversations which offers a method of analysing in depth how conversation is managed between two individuals where at least one is aphasic.

Dewart & Summers (1988, 1990, 1995) by *The Pragmatics Profile of Everyday Communication Skills in Children* created a method of exploring the communication that can offer to the specialists a picture of the communicational process from a pragmatic perspective. At the beginning, the method was orientated directed towards the communication of young preschool children with their families and other carers. Later on, this was extended and included an older age group: children of primary school age. This approach attempted to involve parents, teachers and other carers as active partners in exploring the child's communication by providing them with a means of sharing their knowledge about the child in a structured way that would be useful for the practitioner. Central to the approach was a structured interview through which typical communicative behaviors could be described. This approach was not just applicable to children and that similar means might be devised for investigating communication in adults; a number of professionals involved with adults with communication difficulties encouraged the development of the *Pragmatics Profile of Everyday Communication Skills in Adults.*

In this study we have a qualitative and descriptive approach of the communication's pragmatic assessment using the *Pragmatics Profile of Everyday Communication Skills in Adults* (Dewart & Summers, 1996). The data collection takes into account the Deafblind person's perspective and also the one of a significant person for the Deafblind because we consider very important the direct information from them.

3.1. Aim and research questions

The aim of this study was to investigate the pragmatic aspects of Deafblind adults' communication with the help of qualitative methods of collecting and analyzing the data. We were interested in evidentiate the communication particularities in the case of Deafblind

persons from the perspective of communicative functions, responses to communication, interaction, conversation and contextual variation. According to the aim of this study we focused on the use of language in social situations and on the interpreter's role in communication.

Research questions:
(1) Which are the main communication systems used by Deafblind persons to express their intention?
(2) Which are the communication forms that Deafblind persons can respond?
(3) Which are the difficult aspects of Deafblind person's communication on expressing intentions and offering responses?
(4) How the Deafblind person's conversations take place?
(5) How the Deafblind person's communication varies according to persons and places?
(6) Which is the interpreter role for the Deafblind persons?
(7) How much the Deafblind person and the significant person responded similarly to the interview based on the *Pragmatics Profile of Everyday Communication Skills in Adults?*

3.2. Method

3.2.1. Participants

In this study we involved twelve persons, six adults wit congenital of acquired Deafblindness from The Romanian National Association of Deafblind Persons and six members of their families or close friends. The distribution according to genre was symmetrical: males N = 6, and females: N = 6. The age of the participants ranged from 21 to 68 years, mean age being 38.83 years (*SD* = 17.04). In the group of Deafblind adults, three were congenital Deafblind and three acquired Deafblindness because of meningitis, diabetes and ageing. The dyads were as follows:

The first dyad includes the Deafblind person V.A. and his personal interpreter V.M.; V.A. was born on 05.09.1944 in Borcea village and when he was two years old he lost his vision and hearing because of meningitis. When he was 11 years old he begun the educational process at The Highschool for Visually Impaired Students from Cluj-Napoca; later, he studied at the Department of Special Education from the Babes-Bolyai University becoming teacher at The Highschool for Visually Impaired Students, Cluj-Napoca. V.M. was born on 21.09.1988 in Sibiu, because of his visual impairment he was a student of The Highschool for Visually Impaired Students from Cluj-Napoca when he meet at an early age V.A who was his modelage teacher. He graduated the Special Education Faculty from Babes-Bolyai University and he is V.A.'s interpreter for many years using as main communication system the Block alphabet and the Braille system.

The second dyad 2 includes the Deafblind person E.G. and his friend V.T.; E.G. was born on 15.09. 1955 in Cluj-Napoca and she graduated the vocational training in Iaşi. She dedicated her life to raising 7 children, two of then being congenital Deafblind. She has acquired Deafblindness caused by diabetes and she communicates through Sign language and tactile sign language adapted because of the nyctalopia she is suffering off. V.T. was born on 7.11.1977 in Vulcănești, he is teacher and he met E.G. during activities of The Romanian National Association of Deafblind Persons. Their preferred system of communication is the Sign Language accompanied by verbalization because V.T. is beginner in learning this language.

The third dyad includes the Deafblind person A.B. and her son Ș.B ; A.B. was born on 9.02.1955, graduated secondary education and has acquired Deafblindness. She lives in Timişoara with his Deaf husband and his son that was born on 9.09.1978 in Timişoara, he graduated university and from 2004 he was involved as interpreter in The Romanian National Association of Deafblind Persons. Their communication is based on the Sign language with tactile adaptations especially in conditions of poor light.

The fourth dyad includes the Deafblind person A.P. and his friend I.T; A.P. was born on 5.09.1990 in Buzău and he has congenital Deafblindness caused by the Alport Syndrome. In 1999 was integrated in the Deaflind unit from The Highschool for Visually Impaired Students, Cluj-Napoca where I.T. was his teacher for 5 years. I.T. was born on 10.10.1979 in Cluj-Napoca and from 1999 is involved in the Deafblind field, educating Deafblind / Multisensorial impaired children and being a national trainer for teachers that educate Deafblind / Multisensorial impaired children. Their system of communication is the oral language because the A.P. hearing los sis compensated by performant hearing aids.

The fifth dyad includes the Deafblind person C.G.and her sister M.G.; C.G. was born on 24.12. 1983, in Cluj-Napoca, with congenital Deafblindness caused by the Usher Syndrome. She graduated vocational training and in the present she is employed in a tailoring company. M.G. was born on 4.12. 1986, in Cluj-Napoca, she graduated university and a master included, in present being involved in an NGO. The communication of the two sisters is based on Sign Language and in poor light environments or during the evenings because of the nyctalopia they use Tactile Sign language.

The sixth dyad Diada 6 includes the Deafblind person I.T and her aunt M.C.; I.T. was born on 15.07.1989 in Cluj-Napoca with congenital Deafblindness. She graduated The highschool for Visually Impaired Student and in the present she is a University student. M.C. was born on 26.05.1952 in Cojocna, Cluj County. Thei communication system is the oral language and gestures, the dual sensory impairment being compensated by glasses and performant hearing aids.

3.2.2. Procedure

The participants in this study were individual interviewed, in sessions of about one hour, in which they were asked also elucidative questions. The Deafblind person's interview upon the *Pragmatics Profile of Everyday Communication Skills in Adults* needed a longer time to complete the interview because E.G, C.G., V.A. and A.B. used an interpreter to facilitate the communication. The other significant persons were interviewed upon the *Pragmatics Profile of Everyday Communication Skills in Adults - Other's report version.*

The interviews were video recorded and transcribed obtaining 50 pages written at 1 line spacing (mean: 4.16 pages/per participant).

Previous the interview, the participants were informed about the purpose of the study, the duration of the interview and about their right to withdraw or to break off the interview if they want. We mentioned that the answers are used in research and are not judged according to moral, values or correctness. The interviews took place as follows:

- The first dyad: the interview with V.A. took place on 2.05.2012 using as receptive communication system the Block Alphabet and then V.A. responded using his laptop with Braille display; the interview with V.M. took place on 16.11.2011.
- The second dyad: the interview with E.G took place on 7.09.2011 using as communication system the Sign Language; the interview with V.T. took place on 7.05.2012.
- The third dyad: the interview with A.B. took place on 3.05.2012 using as communication system the Sign Language; the interview with Ș.B. took place on 3.05.2012.
- The fourth dyad: the interview with A.P. took place on 29. 03.2012; the interview with I.T. took place on 19.09.2011, in both cases the main communication system was the oral language with specific amplification for A.P.
- The fifth dyad: the interview with C.G. took place on 28.09.2011 using as communication system the Sign Language; the interview with M.G. took place on 10.05.2012.
- The sixth dyad: the interview with I.T. took place on 9.05.2012; the interview with M.C. took place on 9.05.2012, in both cases the main communication system was the oral language with specific amplification for I.T.

3.2.3. Research Instruments

The semi-structured interviews from the present study were made according to the adapted *Pragmatics Profile of Everyday Communication Skills in Adults* and *Pragmatics Profile of Everyday Communication Skills in Adults - Other's report version* elaborated by Hazel Dewart and Susie Summers in 1996.

This profile is a method of exploring communication from adolescence to old age, offering the possibility of both interviewed persons to contribute with their perspective on the pragmatic aspects of communication.

The *Pragmatics Profile of Everyday Communication Skills in Adults* shows aspects from the daily interactions of the person by the descriptions from interviews taken with the Deafblind person and one taken with a family member or a significant person who knows very well the person. So, the authors elaborated two versions: one for a family member, friend, partner or other significant persons and one for the subject. Versions were compatible because both persons were interviewed on same situations and experiences. Therefore, the 37 questions were developed to permit the significant person to talk about the subject and the subject to reflect on his own communication. The questions' focus sis on the communication abilities not on the communications' difficulties.

The present study uses *Pragmatics Profile of Everyday Communication Skills in Adults* and *Pragmatics Profile of Everyday Communication Skills in Adults - Other's report version* translated into Romanian and adapted to the Deafblind persons by the author of this thesis.

3.3. Data analyze

Data processing was done by thematic analysis method (Boyatzis, 1998) which is a coherent way of organizing and decoding the material by relating it to the research questions This kind of analyse assure the identification of recurrent themes that can appear in the individual conceptualization of a phenomenon (Fereday & Muir-Cochrane, 2006) and mentains a specific level of internal coherence in revealing the phenomenon's significance. The theme represents a coherent *pattern* of argumentation, detectable in the investigated material (Băban, 2002) which requires description and organization of the data and interprets all the aspects of the phenomenon (Boyatzis, 1998). Therefore, the thematic analyze is a method of recognizing the data patterns, the emergent themes being the analyze's categories. In the context of thematic analyze we underline the iterative and reflexive character in the settlement process of categories and themes (Denzin & Lincoln, 1994) and also we need to follow the research questions and to respct the subjects' particularities.

The thematic analysis method consists in six stages, some of them being common to other methods of qualitative analysis: familiarizing with data, initial codes generation, identifying themes, their review, naming and defining themes, elaboration of the report (Braun & Clarke, 2006).

The initial analyze was followed by the data reduction to permit the identification of the emergent themes. The themes that we identified in the interviews' content sintetize the characteristics of communication from the pragmatic point of view.

The coding schema contains four general themes: communicative functions, responses to communication, interactions and conversations, contextual variation, each theme having more sub-themes.

The theme *communicative functions* includes the sub-themes: Attention directing, Requesting, Rejecting, Expression of Emotion, Self-Assertion, Giving Information, Narrative: Telling stories and Jokes.

The theme *responses to communication* includes the sub-themes: Gaining Attention, Understanding the Spoken Word, Response to Nonliteral Language, Understanding the Written Word, Responding with Amusement, Response to Conflicting Views, Responding to Hints.

The theme *interactions and conversations* includes the sub-themes: Initiation, Maintaining an Interaction or Conversation, Presupposition and Shared Knowledge, Conversational Repair, Overhearing a Conversation, Joining a Conversation, Terminating a Conversation, Compliance with Social Conventions, Interactant's Reactions.

The theme *contextual variation* includes the sub-themes: Persons, Places, Topics, Situations Causing Particular Difficulty, Sociolinguistic Awareness and Role of the interpreter.

3.4. Discussions and conclusions

The data of this study, that analyzed the Deafblind adults' communication from pragmatic perspective, combined points of view, values, personal meanings, and in other words implicit theories of the participants about communication. Their integration permitted to the communication's profile to take shape as an explicative frame for the pragmatic aspects involved in communication. This explicative frame is build from the themes identified in the interviews and underlines the various sides of the emergent communication in the case of Deafblind persons. This study emphasized the communication profile of Deafblind persons underlining their heterogeneity.

Using the *Pragmatics Profile of Everyday Communication Skills in Adults*, we gave to the Deafblind persons the opportunity to share their opinions and perceptions. This direct information is precious in the area of language disorders because there is a trent that the persons close to the Deafblind persons have the tendencies to speak instead of the Deafblind person. Even if the Deafblind person's language skills were limited, with the help of the interpreter we realized the entire interview in order to find the pragmatic aspects of communication in the case of as many Deafblind persons as possible.

The present study succeeds to answer the following research questions: (1) Which are the main communication systems used by Deafblind persons to express their intention? (2) Which are the communication forms that Deafblind persons can respond? (3) Which are the difficult aspects of Deafblind person's communication on expressing intentions and offering responses? (4) How the Deafblind person's conversations take place? (5) How the Deafblind person's communication varies according to persons and places? (6) Which is the interpreter role for the Deafblind persons? (7) How much the Deafblind person and the significant person responded similarly to the interview based on the *Pragmatics Profile of Everyday Communication Skills in Adults?*

To *express their intention* the Deafblind persons can use natural gestures, symbols, speech, oral language amplified, Sign Language, Tactile Sign Language, writing, Braille, computer systems and using the Internet. All these systems need to be adapted depending on the particularities of the Deafblind person and the purpose for which they are used: for example giving information, requesting, narrative. The difficulties in expressing the intentions can be overcome through the use of access technologies, or by an interpreter entitled to use the specific language of the Deafblind person. A detail mentioned by Alley & Keeler (2006) is the need for a longer period of time in case of communication with Deafblind persons because of the peculiarities of communication systems.

The communication forms to which, in general, the Deafblind persons can respond are: gestures, Sign Language, Tactile Sign Language, words in context, amplified speech, Braille, print, dactyls expressed by vision or touch, computer systems adapted to Deafblindness. The desired result of effective communication is to increase the Deafblind person's level of independence and, consequently, increase the quality of life.

The *difficult aspects* of Deafblind people's communication about the expression of intentions and answers depend to the peculiarities of Deafblind persons relating to their specific communication, factors of the environment in which communication takes place, the characteristics of the message and the communication partner.

For example, hints, metaphors, inaccurate language, contradictory opinions are cases in which the majority of participants in this study told us that thay face difficulties. Overcoming difficulties can be done through adjustments to the environment, changes in the behaviour of communication partner, adjustments of the message for the purposes of simplification, the additional explanations or the involvement of an interpreter as a facilitator of communication.

Initiating, maintaining and orientation the Deafblind person's conversations respect principles of Grice (quoted by Moore, 2001) relating to the quality, quantity, relevance and style. The interlocutors must show respect and have to communicate the truth anchored in arguments. In conversations, the two partners must have equivalent roles and to a conversation to be as effectively as possible they must avoid interruptions of the conversation and jumps from one topic to another. The relevance of the covered topics depends on the context and on the personal interests. Conversational style must be clear, structured, without ambiguities. The conversations depend on the communication system involved: oral, signed or tactile because each system prints on the conversation a specific pattern.

Contextual variations are very evident in the case of Deafblind persons and determine a heterogeneous profile of communication. The communication must be adjusted depending on the person and place through specific strategies for people with Deafblindness. Hart (2010) shows that the conversation partners may exceed the limits imposed by the present and develop very diverse dialogues depending on the preferences of those involved in the communication; movements, gestures, signs are developed through this partnership and can be adapted to different contexts.

The *interpreter's role* in The Deafblind adults communication is a leitmotiv that appears frequently in both the responses of persons with Deafblindness and in the response of their significant persons. It is essential that the interpreter is working for the benefit of both: the Deafblind person and the hearing persons because the interpreter facilitate their understanding; without the interpreter the person with deficiency cannot be understood if the person uses only sign language or other specific communication systems and the hearing person cannot be understood if he uses only the verbal language. An anonymous representative quote about what an interpreter means for a Deafblind person is: "You are just a person in the world, but for the Deafblind person you are the whole world." It captures the reality from the perspective of the person who wishes to discover the world and needs appropriate pathways of receipting and transmitting information. In this context, it is essential also the education of Deafblind persons with because the interpreter relies on cognitive and linguistic baggage of the person for the interpretation.

McDermid (2009) define that interpreters with Deaf parents can acquire sign language easier during their training as interpreters because they were exposed early on to this form of communication. They also can be very good trans-cultural mediators, knowing both cultures, thanks to the contacts with the hearing and the Deaf from a young age. However, all of these favorable conditions do not exclude the need for quality training in an accredited program. Being a complex process, the interpretation process includes a volume of interpretation skills that surpass the mere knowledge of the two forms of language. To train qualified interpreters, the accredited programs must offer completion of phases; between these phases are the permanent vocational training through workshops, seminars and conferences, developing research projects, specific placements, practice, etc.

According to RID (1996, 2007) a qualified interpreter must possess the following skills: professionalism; fluency in your own language; inclinations for the second language; strive to be certified; to participate in seminars, workshops and other forms of vocational training; to have knowledge related to the understanding and processing of information; to acquire the responsibility on the tasks; to have the ability to cope with new situations while interpreting; when the interpreter cannot cope with a task to accept to be replaced; to have availability to work in groups and to provide support to other interpreters.

The study presents a number of limitations arising from the qualitative methodology used: the small number of participants, the results can be generalized only at the level of the

participants in this study, but still, some conclusions can have significant implications for similar cases. Future studies should cover a larger sample, and the results should be read in conjunction with more quantitative data.

FINAL CONCLUSIONS

In presenting the final conclusions of the thesis we follow the theoretical and empirical approach of this work in which we investigated the psycholinguistic aspects of the Deafblind communication, underlining the author's personal contributions, the limits of research and future research directions.

Specialized studies which discusses Deafnlindess nationwide are extremely scarce, therefore we consider relevant the outcomes of this thesis that have combined quantitative and qualitative analysis, being structured in three studies which have shown the essential data concerning the communicational process in the case of Deafblind people.

Literature analysis, synthesized in the theoretical framework defined the psycholinguistic perspective on communication, allowed the shaping of the complex profile in the case of Deafblind people and highlighted the heterogeneity which characterizes their communication. The role of literature's synthesis from the psycholinguistic perspective was essential because of the complex nature of the communication, in general, and in particular people with Deafblindness. Conceptual clarifications concerning the psycholinguistic domain with direct application in Deafblindness have led to a better understanding of communication of people with Deafblindness at theoretical and practical level. Current state of research in the field of Deafblindness is marked by the need for theoretical and empirical integration of information, and the need for more rigorous scientific research. If we analyse the psycholinguistic fundamentals we concluded that there is no unified theory of language in the context of the Deafblindness and Multisensorial impairment. However, we consider that the theoretical approaches listed in this thesis are useful for understanding the communicational process and for shaping the complex framework for development of expressive and receptive communication in the case of people with Deafblindness.

In **the first study** we investigated the differences in assessing the signs iconicity by blind people, people with hearing impairment and teachers of Deafblind students, by persons with different levels of familiarity with Sign Language, as well as by persons with different levels of schooling.

The study results confirmed the initial presumptions, indicating that there are significant differences between the way the iconicity is assesses by the blind people, people with hearing impairment and teachers of Deafblind students in the case of grammatical categories as: nouns, adjectives, adverbs and in the case of the hand configuration of signing: straight, curved or combined configuration. We could notice a pattern in terms of the impairment type influence on the dependent variables, namely: do not have revealed significant differences between the blind and the sighted instead have revealed significant differences between Deaf persons and other categories of impairments. It has been observed that Deaf people assess iconicity in the case of most grammatical categories and in the case of the hand configuration of signing at a higher level than the other two groups of subjects.

Familiarity of the participants with Sign Language, in this study was an independent variable with effect on how iconicity was assessed, leading to the emergence of significant differences in the case of nouns, adjectives, adverbs, and the type of straight and curve configuration. More specifically, the people of medium familiarity with Signs Language assessed the sign iconicity below people very familiar with Sign Language. In the context of iconicity and the use of iconic signs by Deafblind people, familiarity leads to a better evaluation and use of signs taking into account aspects of their meaning.

The results have shown that there are significant differences between people with different levels of schooling in the assessment of sign iconicity on the following grammatical

categories: nouns, adjectives, verbs, adverbs and prepositions. This result indicates that the ability of assessing signs and symbols iconicity developed gradually during the period of early and pre-school is uniform throughout the adult age, not influenced by age.

The presence of significant positive correlations between all the grammatical categories and the hand configuration of signs proves the involvement of joint mechanisms that are the base of all these variables. The existence of strong correlations between grammatical categories and signs configurations shows a duplication which demonstrates that sign language can be classified according to grammatical categories and according to the hand configuration of signing.

The practical implication of the study could be seen from the fact that the assessment of sign iconicity by persons who do not know Sign Language is the most useful criterion in determining the value of the iconic signs and in the selection of those signs which are then introduced into the programs of intervention for the development of communication skills. In the same sense, Griffith and Robinson (1980) came to the conclusion that the rankings according to iconicity anticipates which signs are expected to be easier acquired by children with special educational needs.

The **second study** has been carried out with the aim of investigating the effectiveness of an intervention program: **Talking Hands** based on signs and symbols used in the case of children with Deafblindness / Multisensorial impairments.

The study results showed the existence of significant differences between the pre-intervention, the post-intervention and the follow-up phases in acquiring the items expressed through signs and symbols. Thus, the intervention has been shown to have significant impact on acquiring the proposed signs and symbols; have identified significant differences between the stage of pre-intervention, the post-intervention and the follow-up phases, but not in the case of oral language. The progress after the implementation of the intervention program is evident, especially between pre-intervention and post-intervention stage, but at the stage of follow-up we noticed a small setback.

Results from analyzing the ***Talking Hands*** levels showed the existence of significant differences between the expressive and receptive communication especially at level 2 and 4 in the sense that students have achieved better results in the assessment of receptive communication. Cohen's d indicator shows a very large effect sizes, students having a better receptive communication of signs and symbols.

Results of the study confirmed the data obtained by other researchers that pointed out that, in general, in the case of children with Deafblindness / Multisensorial impairments, the linguistic aspects of receptive communication are more developed than those of expressive communication systems.

The **third study** was based on a qualitative design research and the data were collected through a semi-structured interview to dyads made up of Deafblind people and significant people for them. Data from this study that analyzed the Deafblind adults communication from a pragmatic point of view revealed a combination of perspectives, values, and meanings, in other words, the theories implied on the communication of the participants. Their integration has allowed the shaping of a communication profile that provides an explanatory framework for the pragmatic aspects involved in communication. This explanatory framework is made up of the themes found in the interviews and highlights the various emerging facets of Deafblind communication and their heterogeneity.

The use of *The Pragmatic Profile of Everyday Communications Skills in Adults* offered the possibility to the Deafblind persons to make known their views and perceptions. This study answered key questions related to the communication systems used by Deafblind people for expressing intentions, has identified the main forms of communication that Deafblind people can respond, founded the difficult aspects of Deafblind communication on the expression of intentions and offering answers, described how are the conversations between Deafblind people and how the communication changes depending on the people involved and places. An important aspect which emerged as a leitmotiv was the presence of the Sign Language interpreter and the qualitative study revealed what is the role of the

interpreter for people with Deafblindness.

The obvious agreement signed between people with Deafblindness and their significant persons demonstrate that pragmatic aspects of communication are understood similar and can be a starting point in addressing the communication's interventions in the case of Deafblind people. We identified three ways in which the intervention can be effective: (1) encourage the Deafblind person to consider a possible change in its communicative behavior, (2) encouraging the significant persons for the Deafblind person to consider a possible amending in certain aspects of their own behavior in order to increase the communication efficiency of the Deafblind person and (3) focus on issues related to adaptation of the person's communicational environment to facilitate communication.

This thesis combined the quantitative analysis through descriptive and inferential procedures and qualitative thematic analysis.

We have confirmed the presumptions of the studies presented in the subchapters 4.2.1., 5.2.1. and 6.1. but they still left many questions that thesis was unable to respond and which remain to be clarified later in subsequent researches.

At the level of educational practice, we can apply the principles of intervention for Deafblind children according to the second study which deals with: the interactive process of teaching and learning, signing through correct techniques and adapted to the peculiarities of the children, the use of symbols based on visual acuity, effective communication for various contexts, the appropriate expressive and receptive language communication (taking into account that the receptive language part is much more developed in these students), the systematic observation needed in the process of assessment and intervention, the importance of encouraging the student and the other factors involved and the reward which wants to transform the extrinsic motivation into intrinsic motivation.

The limits of the research and directions for further investigation

This research presents a series of limits. The objective limit is the reduced number of Deafblind participants caused by the very low incidence of the dual sensorial impairment. Another limitation concerning the participants referred to the evident heterogeneity of Deafblind persons involved.

Other limits are generated by the qualitative methodology used that makes some conclusions to have significant implications only in similar cases, therefore, the power of the results' generalization of the quantitative and qualitative studies from this thesis being quite restricted.

A limitation with regard to the materials used in the first two studies is the exclusion of a number of dissimilar dissimilar nouns, verbs, adjectives, adverbs, pronouns, prepositions, and interjections.

The difficulties encountered in the process of documentation and in the development of this thesis are determined primarily by the lack of specialized studies in the field of Deafblindness due to the fact that most of those involved in the education of Deafblind children are pragmatic professionals and they seldom undertake to do basic research.

Then, the difficulties encountered in the course of quantitative and qualitative analyses were tied to the heterogeneity of the participants that caused a specific research design. Going over difficult issues, we believe that the relevance of this thesis comes from the psycholinguistic approach to communication in the Deafblind adults and children having a significant contribution to the identification of educational implications of theoretical and practical value.

Given that this thesis is one of the few in the field of Deafblind research, we believe that it can be enhanced through further research that should make a stronger theoretical reasoning and empirical studies which combine quantitative analysis with qualitative analysis.

In regards to our plans for the future, we will want to expand the research for a larger sample of population at the national level with the help of The Romanian Association of

Deafblind Persons.

Further studies could enhance this direction of research on Deafblind communication investigating different aspects of communication in a longitudinal research, because longitudinal studies offer more complex information about the factors involved in the investigations.

Also, future studies should cover a larger sample and the results should be read in conjunction with the more quantitative data and should include complementary evaluation to eliminate any variables that may distort the results.

Another possible approach for the future refers to the development of ***Talking Hands*** program by including more items to match both the stages of development and interests of pupils with Deafblindness/multisensorial impairments.

A possible future direction may be investigating the communication in relation to other cognitive processes, assistive technologies and social integration.

We consider that this thesis makes a significant contribution to the development of the field Deafblind communication in two main directions: the study of the specialized literature and the investigations carried out with empirical studies about the communication of Deafblind people.

Because the thesis deals with a theme of research little explored by Romanian researchers, certainly that the research results can contribute significantly to raising the academic level of understanding Deafblind communication and to identify pragmatic implications of the results obtained.

In closing, it's important to emphasize once again the importance of a thorough research of the communication as it combines the scientific aspect with the joy of the interaction; the role of communication through Sign Language is described by a deaf-blind person in the following manner:

My hands are . . .My Ears, My Eyes, My Voice . . .My Heart.

They express my desires, my needs.They are the light that guides me through the darkness

They are free now, no longer bound to a hearing-sighted world. They are free They gently guide me (…)

They are my freedom from a dark silent world

They are my window to life. Through them I can truly see and hear (…)

They are my key to the world (…)

They are me

(Stine, 1997)

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