



# Perception of the parents on pragmatic abilities of deaf children attended in hearing rehabilitation services

Percepção de familiares sobre as habilidades  
pragmáticas de crianças surdas atendidas em  
serviço de reabilitação auditiva

Percepción de familiares sobre las habilidades  
pragmáticas de niños sordos atendidos en  
servicio de rehabilitación auditiva

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## Abstract

**Objective:** To describe the pragmatic abilities of deaf children in situation of daily communication, from the perception of family members. **Methods:** qualitative descriptive study. It was developed with families and deaf children who attended a hearing rehabilitation service of a federal public university. It was applied with the families the First Part: Assessment of Pragmatic Profile from “Protocol for the Assessment of Communicative Abilities and Language of Deaf Children”. Analysis of the data was carried out in a table of records composed of checklist, in which it was reported the occurrence of 33 communicative abilities and the modality in which they occurred. The data were submitted to descriptive statistics and graphical analysis by STATISTICA 9.1. **Results:** Most of the pragmatic abilities were present in all of the studied children. The highest occurrence of skills corresponded to the “Answer to Communication” section, followed by “Communicative Intent” and finally “Interaction and Conversation”. Regarding the skills of the “Change in Context” section, most children are able to adapt the way of communication to the context they are into. From the parents’ point of view, the preferred communication mode of the children was the visual-spatial (40.3%), followed by bimodal (18.8%) and

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**Authors’ contributions:** GBN elaboration of the manuscript, data collection and analysis; TMK data analysis, manuscript revision.

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**Received:** 16/09/2016

**Accepted:** 15/02/2017



oral-aural (15.4%). **Conclusion:** The family members were able to describe the linguistic behavior of the deaf children. Thus, they understand that their children have communication skills and are able to establish a dialogue with an interlocutor.

**Keywords:** Deafness; Family; Language Development; Speech, Language and Hearing Sciences

## Resumo

**Objetivo:** Este artigo tem como objetivo descrever as habilidades pragmáticas e caracterizar a modalidade comunicativa de crianças surdas em situação de comunicação cotidiana, a partir da percepção dos familiares. **Método:** Estudo descritivo e qualitativo. Foi desenvolvido com familiares e crianças surdas de um programa de reabilitação auditiva de uma universidade pública federal. Foi aplicada com os familiares a Primeira Parte: Avaliação do Perfil Pragmático do “Protocolo de Avaliação das Habilidades Comunicativas e de Linguagem de Crianças Surdas”. A análise dos dados foi realizada em quadro de registros composto por checklist, no qual foi assinalada a ocorrência de 33 habilidades comunicativas e a modalidade em que ocorreram. Os dados foram tabulados em planilha e submetidos à análise gráfica e descritiva pelo programa STATISTICA 9.1. **Resultados:** A maioria das habilidades pragmáticas estava presente em todas as crianças do estudo. A maior ocorrência de habilidades correspondeu à seção “Resposta para a Comunicação”, seguido de “Intenções Comunicativas” e por último “Interação e Conversação”. Relacionado às habilidades da seção “Variação do Contexto”, a maioria das crianças é capaz de adequar a maneira de comunicação ao contexto ao qual estão inseridas. Na percepção dos familiares, a modalidade comunicativa preferencial das crianças foi a visuo-espacial (40,3%), seguido de bimodalidade (18,8%) e oral auditiva (15,4%). **Conclusão:** Os familiares foram capazes de descrever os comportamentos linguísticos das crianças surdas. Dessa maneira, compreendem que suas crianças possuem habilidades comunicativas e apresentam condições de estabelecerem um diálogo com um interlocutor.

**Palavras-chave:** Surdez; Família; Desenvolvimento da Linguagem; Fonoaudiologia

## Resumen

**Objetivo:** Este artículo tiene como objetivo describir las habilidades pragmáticas y caracterizar la modalidad comunicativa de niños sordos en situación de comunicación cotidiana, a partir de la percepción de los familiares. **Métodos:** Estudio descriptivo y cualitativo. Fue desarrollado con familiares y niños sordos de un programa de rehabilitación auditiva de una universidad pública federal. Fue aplicada a los familiares la Primera Parte: Evaluación del Perfil Pragmático del “Protocolo de Evaluación de las Habilidades Comunicativas y de Lenguaje de Niños Sordos”. El análisis de datos fue realizado en cuadro de registros compuesto por checklist, en el cual fue marcada la aparición de 33 habilidades comunicativas y la modalidad en la que ocurrieron. Los datos fueron tabulados en planillas y sometidos al análisis gráfico y descriptivo por el programa STATISTICA 9.1. **Resultados:** La mayoría de las habilidades pragmáticas estaban presentes en todos los niños del estudio. La mayor aparición de habilidades correspondió a la sección “Respuesta para la Comunicación”, seguido de “Intenciones Comunicativas” y por último “Interacción y Conversación”. Relacionado a las habilidades de la sección “Variación del Contexto” la mayoría de los niños son capaces de adecuar la comunicación al contexto al cual están insertados. En la percepción de los familiares la modalidad comunicativa preferencial de los niños fue la visuoespacial (40.3%), seguido de bi-mobilidad (18.8%) y oral auditiva (15.4%). **Conclusión:** Los familiares fueron capaces de describir los comportamientos lingüísticos de los niños sordos. Así, comprenden que sus niños poseen habilidades comunicativas y presentan condiciones de establecer un dialogo con un interlocutor.

**Palabras clave:** Sordera; Familia; Desarrollo del Lenguaje; Fonoaudiología

## Introduction

Hearing loss in children can be detrimental to the development of speech and language. To minimize its negative effects, it is essential the use of technological resources such as hearing aids and cochlear implants, enabling the hearing rehabilitation of children at an early stage of development and acquisition of language<sup>1</sup>.

The first years of life of children with hearing loss or deafness are essential for the development of language and hearing. That is when there is greater neuronal plasticity, a great time for the child to be exposed to auditory and language experiences as early as possible<sup>2</sup>.

An important aspect of language is pragmatics, since it provides a theme to the use of language, addressing the relationship between communication, user, and context. When related to the field of language acquisition, it aims to understand the way children learn its use, investigating in what ways they learn to communicate with others and to use rules such as a shift change during the conversation and employment of a varied language for specific situations, adapting speech for different listeners<sup>3</sup>.

Regarding deafness, if the family does not understand the specificities of the child, or does not have access to the necessary conditions for its development, the infant can be deprived of the appropriate language development, so that the hearing loss can lead to language delay.

It is known that deaf children of hearing parents experience few situations in which the effective use of language in situation of interaction with their parents occurs. Deaf people are subjected to language learning situations with adults who are not their own family, or learn sign language in the educational space with a deaf teacher and oral language in the clinical space with a speech therapist<sup>4</sup>.

It is considered that, through pragmatics, the use of language can be broadly assessed in deaf children because the linguistics functioning of the child is observed in relation to the living context and interaction with the interlocutor<sup>5</sup>.

The evaluation of pragmatics focuses not only on verbal aspects, but also in the non-verbal aspects that are best explored by deaf children in the early stages of development. This assessment can be carried out through the characterization of the communication skills of children and communicative competence. It is evaluated by observing verbal and

nonverbal aspects during interaction with an adult peer or by the perception of the parents<sup>6,7</sup>.

The investigation of pragmatic abilities when performed on daily contexts, outside the clinical context through interviews with parents, children can explore the communication more fully, providing data to the speech therapist that can complement the therapeutic practice.

The following research aims to describe the pragmatic abilities and characterize the communicative mode of deaf children in everyday communication situations, from the perception of the family.

## Methodology

This descriptive study with a qualitative approach, was approved by the Research Ethics Committee of the Universidade Federal de Santa Maria, Rio Grande do Sul, under the CAAE number 26743114.9.0000.5346. Study participants signed the Informed Consent Form (ICF), following all ethical principles.

All participants were attending the Speech Therapy Service (SAF) which provides services for the Unified Health System (SUS). The service is linked to the clinical speech therapy school at the Universidade Federal de Santa Maria, and is classified as medium complexity, according to the decree number 2.073/GM on hearing health, established in 2004. To select the participants, the following criteria were taken:

### Inclusion criteria:

- Family members: Sign the Informed Consent (IC); be literate, normal hearing and have a child or family member with hearing loss in speech therapy in SAF.
- Children: To be in pre-school age; diagnosed with pre-oral sensorineural hearing loss and use hearing aids in both ears.

### Exclusion criteria:

- Family: Not signing the consent form, having some self-reported hearing loss and being illiterate.
- Children: Being in school age, having post-verbal hearing loss, not using hearing aids.

The sample was composed by conducting a check in the medical records of patients treated at the service. The hospital records prioritized data on the age of the children, school information, hearing records, language, family background, time of use

of hearing aids, and therapy time. 12 subjects, six family members and six children were eligible, considering the inclusion and exclusion criteria.

Data collection was carried out through hospital records, in order to select the study participants. In addition, it was carried out the “Assessment Protocol of Communication Skills and Deaf Children Language PIFFICS”<sup>8,9</sup> with the family members of the children in the study. The protocol used comprises four steps and is designed to select “Speech Therapy Intervention Program for Deaf Children Families - PIFFICS”<sup>8</sup>. This study used only the First Step: Pragmatic Profile Assessment.

This protocol allowed describing the communication of deaf children in everyday situations, through interviews with the family. The interview was conducted in an appropriate room of the SAF in an interval of 30 minutes and recorded with a portable MP3 recorder for later transcription and analysis.

The protocol consists of a checklist, which contains 33 communicative skills, comprised of four sections:<sup>5,8,9</sup>:

- Section 1 Communicative Intent: provides information on varieties and forms of communicative intentions expressed by the child. It comprises eight skills.
- Section 2 Response to communication: provides information on the responses of the child to the interlocutor. It comprises eight skills.
- Section 3 interaction and conversation: sets information on the interactions occurring between the child and the interlocutor. It comprises nine skills.
- Section 4 Context variation: shows the vision of the child as a communicator in many contexts. It comprises eight categories.

To obtain the responses of the family, the protocol also has a complementary part called “The Pragmatic Profile of Communication Initial Skills “, which is based on communication skills proposed by Dewart and Summers (1994)<sup>10</sup>. In the complementary part, examples are described that tell the interviewer the way the categories that make up the pragmatic profile of deaf children should be investigated, in an interview situation with an adult. Thus, following the steps proposed in the protocol, the researcher asked the family what the child does at home, encouraging them to describe in their own words the child’s communicative behavior.

Thus, the investigation of the skills on sections 1-3 was performed with questions that facilitate the answer to every investigated aspect, for example, to investigate whether the child rejects, which corresponds to a skill included in “response to the Communication”, the researcher asked what the child’s behavior is like when the family is giving him food and the child does not want. So, the interviewer waited for an answer, and in case of difficulties in preparing a response, examples were given to assist such as: she cries, turns his head to the other direction; pushes the food; says no; says I do not like or do not want; asks for a different food.

In section 4 the researcher investigated the variation of context, as in the presence of people, places, times of day and times the child communicated more or modified the way to communicate, as the context also modified. The family member’s response was noted in the protocol registration board as a binary answer: “yes” or “no.”

Through examples, it was possible to characterize the communicative modality of children in the perception of family as they described the way the child communicated when the ability was there, for instance, describing whether the child pointed or used gestures, vocalization, words and/or sentences in oral Portuguese or sign language.

For protocol analysis, it was performed an adaptation in the registration table to better suit this study. The aim was to make the recording of data easier and make the analysis clearer. The proposed modifications were followed and discussed as in a protocol recommended by the authors in a more recent study<sup>9</sup>.

Through a checklist, it was drawn the occurrence of each of the 33 communication skills and communicative mode in which they occurred. In skills 26 to 33 (corresponding to the section on the context change), it was only recorded its occurrence or not, since it includes other types of response, not being possible to indicate the mode used.

The communication modes were noted only in the skills from 1 to 25 and were classified into visual-spatial mode: corresponding to the use signs language and gestures; Oral hearing mode: corresponding to the use of oral language and vocalization and Bimodality: corresponding to the use of more than one method in a skill (sign language, gesture, spoken language, and vocalization).

All responses of family were tabulated in a spreadsheet in Microsoft Excel 2010, and subjected

to statistical analysis by software STATISTICA 9.1. Descriptive statistical and graphical analysis was used.

The graphic analysis was used to analyze the correlation between the pragmatic skills, the time of hearing aids use and the subject's therapy time, being presented in boxplots for better visualization of the results.

## Results

The study included six children, five mothers, and one grandmother. The education level of family ranged from elementary school and incomplete college degree. Three family members say they are housewives, one is retired, one is a salesperson and one is a farmer.

With regard to children, three were female and three males. The children were identified by the initial letters of their names so that their identities were preserved. The characteristics of the children and the auditory and linguistic data obtained from hospital records are presented below:

C1: A is a five-year-old girl and has a diagnosis of moderate preverbal sensorineural hearing loss in the right ear and severe in the left ear. She has been using hearing aids for a year and nine months in both ears. She is part of an auditory rehabilitation in the SAF for a year and six months. Regarding language, she uses gestures and vocalizations to communicate, corresponding to the "Bimodal mode". She attends regular preschool education.

C2: AC is a girl of five years and two months old and has a diagnosis of preverbal sensorineural bilateral deep hearing loss. She has been using a hearing aid for six months in both ears. She has been under auditory rehabilitation in a SAF for a year. Regarding language, she uses gestures and vocalizations to communicate, corresponding to "Bimodality mode". She attends regular preschool education.

C3: AK is a girl of three years and nine months old and has a diagnosis of preverbal sensorineural bilateral deep hearing loss. She has been using a hearing aid for a year and four months in both ears. She has been under auditory rehabilitation in a SAF for a year. Regarding language, she uses gestures, vocalizations and isolated signs in LIBRAS to communicate, corresponding to the "Bimodality mode". She attends a special education school.

C4: G is a boy of three years and four months old and has a diagnosis of moderate preverbal sensorineural hearing loss in the left ear and severe in the right. He has been using hearing aids in both ears and has been under auditory rehabilitation in a SAF for two years. Regarding language, he communicates using oral language and makes up simple sentences, corresponding to the communicative mode "Oral Hearing". He attends regular preschool education.

C5: L is a boy of three years and five months old and has a diagnosis of moderate sensorineural preverbal hearing loss in the right ear and moderately severe in the left ear. He has been using hearing aids in both ears for two years and three months and has been under auditory rehabilitation in a SAF for two years. Regarding language, he uses gestures and vocalizations to communicate corresponding to the "Bimodality mode" of communication. He attends regular preschool education.

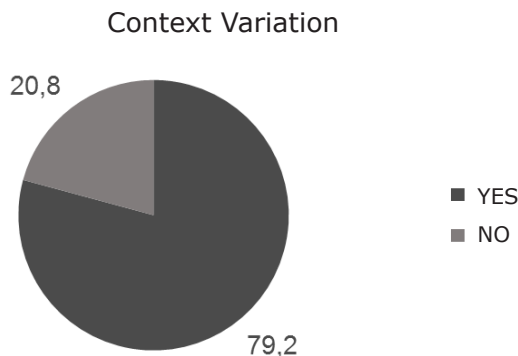
C6: F is a boy of two years and five months old and has a diagnosis of sensorineural preverbal bilateral severe hearing loss. He has been using hearing aids in both ears for two years and has been under auditory rehabilitation in a SAF for six months. Regarding language, he uses gestures and vocalizations to communicate corresponding to the "Bimodality mode" of communication. He does not attend preschool.

Table 1 presents the descriptive analysis of the general data of the study subjects and the occurrence of pragmatic abilities of deaf children.

**Table 1.** Descriptive statistics of the analyzed variables

Variables	Mean		Standard deviation	Minimum	Maximum
	N		N	N	N
<b>General data</b>					
Family Member Age	39,1		±17,2	22	70
Child Age	3,7		±1,0	2,5	5,2
Time Use Prosthesis	1,9		±0,6	0,6	2,3
Therapy time	1,3		±0,5	0,6	2,0
<b>Protocol Sections</b>					
		<b>%</b>			
Communicative intentions	6,3	78,8	±1,9	4	8
Response to the Communication	6,7	83,8	± 1,5	4	8
Interaction and Conversation	5,7	63,3	± 1,0	4	7

Figure 1 shows the result of the occurrence of pragmatic skills corresponding to the “Context Variation.” It is possible to see that in the perception of family members, the children are able to modify the communication according to the context.



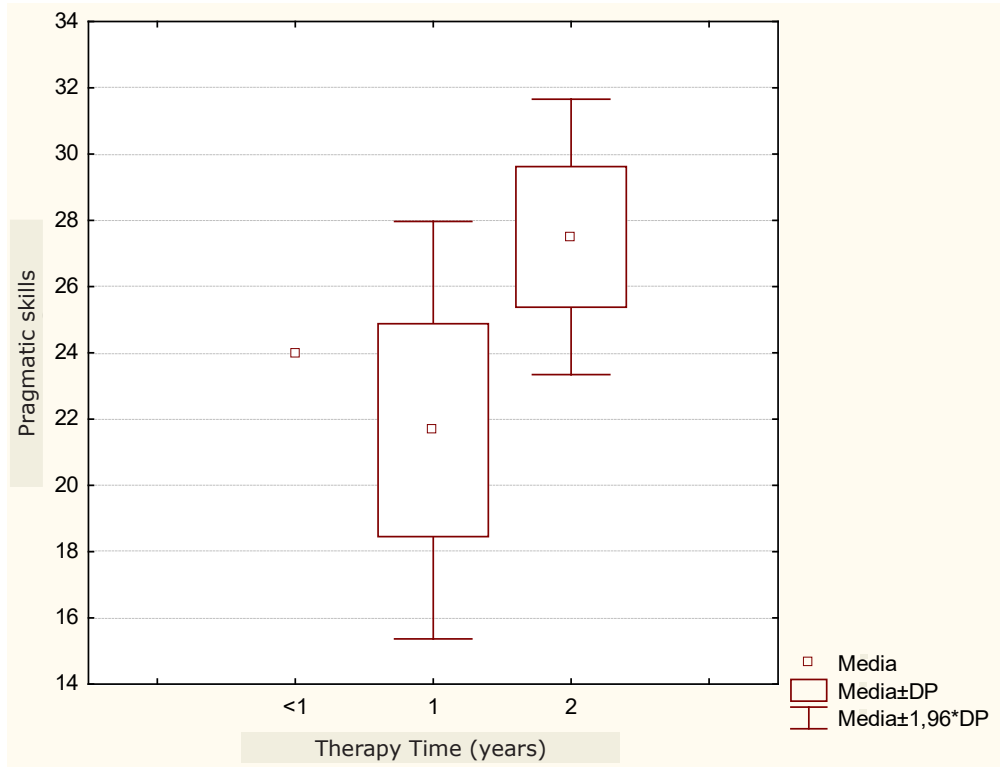
**Figure 1.** Occurrence of the skills section “Context Variation”

Figure 2 shows the association between the occurrences of the 33 pragmatic skills with the therapy time of the subjects. In general, it can be seen that the greatest number of communication skills are associated with longer therapy.

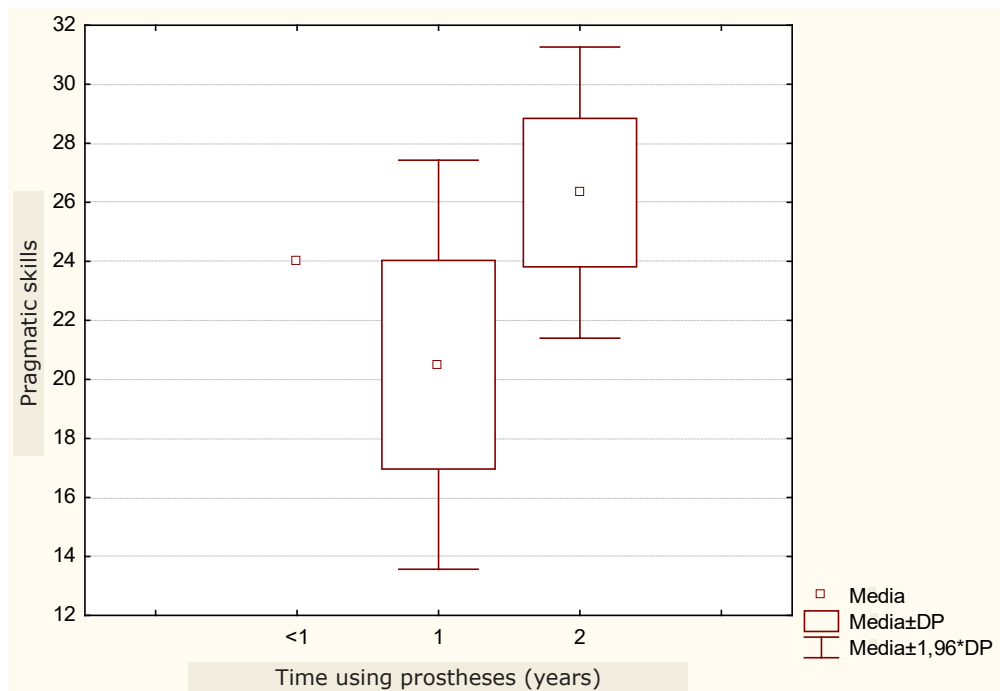
Figure 3 presents the association between the occurrences of the 33 pragmatic skills with the time of use of hearing aids. In general, one can see that the greatest number of communication skills is associated with longer use of hearing aids.

Figure 4 shows that there was more frequency (40.3%) of the visual spatial communication mode in communicative skills of the children, corresponding to the use of gestures and sign language to communicate.

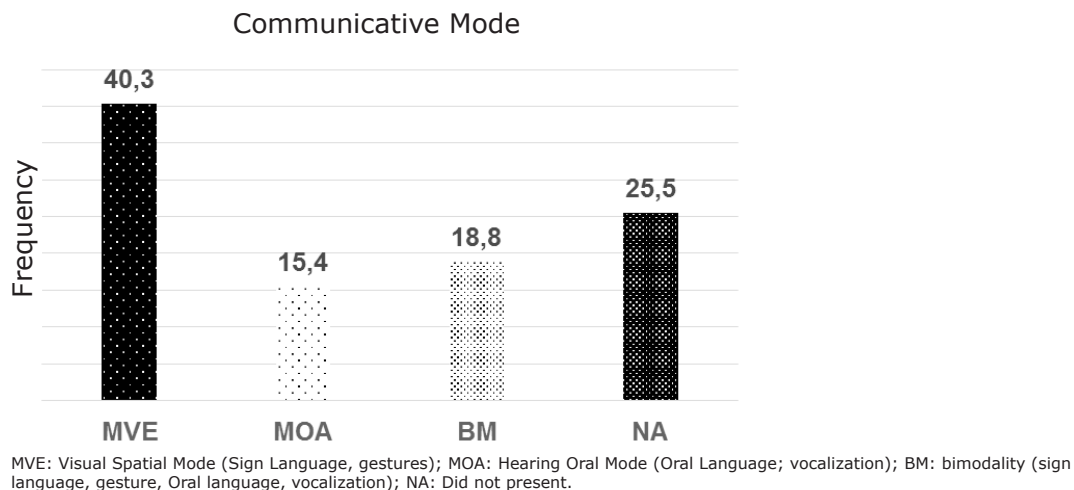




**Figure 2.** Boxplot of the correlation between the variables "Therapy Time" and "pragmatic skills"



**Figure 3.** Boxplot of the correlation between the variables "time using prostheses" and "pragmatic skills"



**Figure 4.** Communicative Mode of the children of the study

## Discussion

The pragmatic skills of deaf children have been described in this study through the perception of the family members. The results showed that family members were able to describe the linguistic behavior of deaf children.

It is possible that the family members provide data to the speech therapist to complement their therapeutic practice. Thus, family members come to better support the language construction and the communicative conditions of their children. The approach that promotes the means and resources for the family involvement in the therapeutic process of the children is a tool that provides better therapist-family-child<sup>11-12</sup> relationship.

Related to the pragmatic skills, it was observed that the family can provide data to therapists in evaluating this linguistic aspect, thereby complementing the pragmatic assessment carried out in the clinical environment. This finding is supported by studies that argue that only the situation of clinical evaluation by the therapist is not sufficient to characterize the pragmatic profile of the children, being necessary to supplement with information provided by parents or family members<sup>5,9</sup>.

Table 1 shows that most of the children in the study were in an early stage of hearing and speech development with an average of 3.7 years of age, 1.9 years of use of prostheses, and 1.3 years of therapy time. This shows that the intervention and hearing rehabilitation was late for most children

in the study. The literature emphasizes that the diagnosis of hearing loss is performed in the first months of life, aiming to achieve the earliest possible intervention, preferably up to six months of age, ensuring the proper development of language and hearing of children<sup>2,13-14</sup>.

Related to the pragmatic skills in the perception of family, children of the study have most of the skills in their communication. It can be seen that the “Response to Communication” section has most of the occurrences of present skills, 6.7 of a total of 8 skills (83.8%). The “Communicative Intent” had 6.3 out of 8 skills (78.8%). The section with lowest incidence of skills was “Interaction and Conversation” with 5.7 out of 9 skills (63.3%).

These results corroborate a previous study that evaluated the pragmatic profile of deaf children in situation of interaction with an adult peer, using the same protocol of this study. There were 30 children in different language phases, a pre-linguistic and another linguistic group. The study found that both groups, linguistic and pre-linguistic, had a higher frequency of occurrence of skills related to “Responses to Communication”, followed by “Communicative Intent” and “Interaction and Conversation”.<sup>5</sup>

It also corroborates a study comparing the pragmatic skills of deaf children with hearing children skills. The authors concluded that deaf children in the study were able to interact and use similar communicative functions as the ones used by the hearing children, differing only in the



number of communicative acts and communicative medium used. The deaf children had fewer communicative acts and used more gestures than the hearing children<sup>6</sup>.

The authors used the Child Language Test ABFW-pragmatic, differentiating slightly the classification of skills compared to the present study protocol. However, it is possible to establish a connection with the results of this study because the children showed a higher percentage in the exploratory communicative function (56.3%), followed by review (12.5%), action request (12.5%), performative (12.5%), and finally display (6.3%). Thus, functions that depended on skills that require greater interaction and conversation had lower percentage than other skills that require less interaction, which is consistent with the results of this study<sup>6</sup>.

Another study aimed to characterize the profile of pragmatic abilities, comparing the dyads deaf/deaf and deaf/listener, and found similar results. The group of deaf children was formed by 11 children with cochlear implants and 13 children using hearing aids. The group of children with normal hearing had a total of 13 subjects. The following communicative aspects were analyzed: verbal, paralinguistic, and non-verbal. The study showed that the pragmatic skills were present in all children, but the group of children with normal hearing got better skills than deaf children. When comparing the group of deaf children using hearing aid with cochlear implants there was no significant difference between them<sup>7</sup> regarding pragmatic skills.

A study conducted with 31 children with hearing loss and 62 children with normal hearing found different results from those presented by previous studies. The children were evaluated in conversation dyads deaf/listener and listener/listener through a specific protocol in English. The study results showed that deaf children were effective in communicating with their listener peers. Deaf children asked more questions, made more personal comments, had greater initiative in dialogue and had larger shifts in the conversation. Among the listener/listener dyad, conversation was more balanced, with similar percentages for each investigated aspect<sup>15</sup>.

Another study evaluating the communicative skills of a deaf child, with associated neurological impairment, using the same protocol of this research found that the child had most of the skills

assessed in a consistent way (92%). However, skills that depended on interaction and conversation with two other people were missing, which can be explained by the fact that children with cognitive impairment have difficulty in social interactions with others. Related to the communication mode, the child used more than one, and the greater part by the use of gestures (76%), followed by sign language (60%), and vocalization (12%)<sup>16</sup>.

The skills of the section “Communicative Intent” had 78.8% of occurrence. It is known that the typical communication development shows that at an early age children understand that their behavior influence their caregivers, although they do not yet have communicative intentions. Throughout the development, influenced by the social environment they belong, they will establish communicative interactions, and at about nine months, they start to use sounds and gestures to communicate. At that time, they already have communicative intentions and draw the attention of the speaker, addressing to them<sup>17</sup>. It is not different for deaf children and the family members of this study were able to realize the communicative intentions of the children, valuing the linguistic interaction between them.

The skills of the section “Interaction and Conversation” had occurrence of 63.3% in this study. These skills are important because they analyze the way the child is perceived as a participant in the interaction, the way communication is started, conversational exchanges, and repairs in the dialogue<sup>18</sup>. The perception that family members have on children in this category will influence the way they will interact with them.

A study evaluating the perception of mothers on children’s skills in the first year of life showed that there was variation in the perceptions at different times of the development of the children, depending on age. It was also observed that some mothers were unaware of the presence of socio-communicative skills in their children, which could interfere with the interaction established. Finally, the study emphasized that data from interviews with parents on communication skills can be useful in planning interventions with children and family, enabling cooperation between professionals and important people in the child’s life to promote the development of these skills and thus contribute for children to participate in the social world<sup>18</sup>.

Thus, when analyzing the interaction and conversation of the deaf children, the speech therapist



should observe the child in conversation with a peer listener and a deaf peer to obtain better information to characterize the pragmatic profile of the patient. It is understood that the communication behavior of the child should not be seen separately from the communication behavior of the interlocutor, since the interpretation of the second causes effects on the interaction of first<sup>19</sup>.

The lower occurrence of skills in the category “Interaction and Conversation” shows not only the difficulties of deaf children in opening and keeping in a dialogue, but also shows the difficulties that families have in communicating with children. These difficulties in communication between the dyad deaf family-child were discussed in a study of 20 family members. The study showed that the difficulties in communication between the family and the child, either by background noise, absence of lip reading, and competitive speech impacts the quality of life of those involved in communication. The study also showed that the older the minor deaf subject, the less communicative difficulties are perceived by family members<sup>20</sup>.

It is also worth mentioning that the skills of this category are more elaborated and complex, requiring the child greater linguistic complexity. Deaf children can acquire all the communication skills, but because they have a slow progress in the development of language skills, and lack of a common language with their parents, they may have a limitation on the quality of communication, making it difficult the linguistic interaction with family listeners<sup>5</sup>.

The statement on limitation in quality of communication discussed in this study corroborates a study that analyzed the amount of family speech shifts directed to two-year-old toddlers with hearing impairment. The study investigated whether children with hearing impairment were exposed to the same number of words during the conversation with parents as hearing children. The results showed that the higher the hearing losses of children, the fewer were the number of words of parents in the conversation. The better the language skills and better the higher the number of communicative skills, more dialogues between parents and children<sup>21</sup>.

Figure 1 showed that the family members realize that deaf children use language to communicate in different contexts (79.2%), regardless of the communication mode used.

A study of children in interaction with an adult interlocutor ranked the pragmatic responses observed in appropriate responses, in which the children responded satisfactorily to the caller, and inadequate responses, in which children issued an inadequate response to the communicative context, as well as insufficient for callers to identify speech topics<sup>22</sup>.

Although the study was conducted with children with specific language impairment and children with normal language development, it is possible to set a relationship with deaf children, as appropriate responses provided by the child can be classified in several ways. The rating used is as follows: proper verbal responses - oral production, in which the child’s response satisfied the adult question; proper gestural responses - gestures, smile, or bodily manifestations related to the question satisfactorily; vocal answers - onomatopoeia, vocalizations, word productions with phoneme omission; contingent answers - response in oral mode that keeps part of the topic or the information contained in the previous communicative act<sup>22</sup>.

When comparing with deaf children participating in this study, even though linguistically most use gestures and vocalizations to communicate, they can provide appropriate responses to the caller in different contexts. However, not all skills in the “Change in Context” section were present (20.8%). This can be explained by the fact that some skills in this section are more linguistically elaborate. Such as the skills “Topic” and “use of social rules” that require from children a more complex communicative mode to dialogue with their families on various subjects as well as understand what is accepted or not socially, and then, adapt linguistically to every situation.

The hypothesis about the difficulties of the deaf with contexts that require linguistic complexity corroborates a study that investigated the ability of the deaf to suit the word to a phrasal context. The deaf have difficulty using the phrase context to improve the recognition of words. The authors concluded that the difficulties of the deaf may be related to a reduced interaction between linguistic experiences and cognitive factors<sup>23</sup>.

Figure 2 and 3 showed that most of the pragmatic ability was associated with the longer usage of hearing devices and longer therapy. In the literature, no studies were found that discuss this direct association with the pragmatic skills,

but few studies discuss the effectiveness of the use of hearing aids and cochlear implants in the communicative success and language development of deaf children<sup>1,21,24</sup>.

The findings of this study corroborate a research that investigated the following relationship: hearing aid usage time with the speech and language of children with hearing loss. The study included 71 children up to 3 years old and 106 children aged 5. The results of the study showed that the longer use of hearing aids was associated with the best benefits with the hearing aids, favoring the development of speech and language. The authors concluded that children with the highest use of prostheses time showed better results in receptive and expressive language. Children were assessed by specific tests in English and scales completed by the report of the parents<sup>1</sup>.

A longitudinal study evaluated the receptive language of nine children using cochlear implant (CI). The study results showed that there was an increase in verbal comprehension of children along the CI use. Thus, the longer the use of the implant the better the verbal comprehension skills of the children<sup>25</sup>.

The same results were found in a study that analyzed the speech intelligibility of CI users over time. The study showed that speech intelligibility levels increased within the use of IC. The deaf cochlear implant users have been able to produce highly intelligible speech. The authors pointed out that the measure of speech intelligibility is important to assess language development since it requires the child's ability in speech perception, linguistic knowledge to plan and execute speech and motor skills to articulate meaningful sentences<sup>26</sup>.

Related to hearing rehabilitation, a study compared the development of two deaf children language, a hearing aid user and another user of cochlear implant, after speech therapy. The authors concluded that in an interval of five months of therapy, it was observed in speech and language development of children and improvement of the evaluated functions. The hearing aid user child achieved better results in all functions. The child with a hearing prosthesis had better results in all functions. It was assessed the use of language in free play, semi-directed play, simple imitation, and sequence imitation. The authors explained that the best performance of the child who used prosthesis, compared to that which used cochlear implant,

happened due to the higher level of listening and shorter sensorial deprivation<sup>27</sup>.

Another study conducted a literature review on the benefits of auditory training in hearing aid users. The authors concluded that auditory training is a strong ally in the hearing rehabilitation and brings improvement in the auditory abilities of users<sup>28</sup>. Although the authors do not discuss the benefits of auditory training for language, or the influence of therapy time in auditory development and improved communication, it can be inferred that they are also important benefits of this type of intervention with individuals with hearing loss.

The results presented in Figure 4 show that most of the pragmatic abilities, as described by family members as present in the deaf children in this study were performed in the visual-spatial mode (40.3%), followed by bimodality (18.8%), and auditory oral modality (15.4%). For the missing skills, it was not possible to classify the communicative mode (25.5%), being classified as "did not present".

A longitudinal study on mother-child dyad investigated the linguistic environment that the mother had for children before and after cochlear implant. The study showed that after the child is deployed there were changes in the communication standard used by the mother during the interaction with her daughter. Increased overall production of communication in oral and decrease in the use of sign language and modes of communication with visual elements. In relation to the child's language, the study showed that the lexical production in oral language was less than lexical production in the visual-gestural language, led to a conflict in communication between mother and child. The mother subsequently changed her communication mode with the child through the use a bimodal pattern as both oral and the visual-gestural mode. However, the rupture of the visual communicative relationship set resulted into a decrease in the linguistic development of the child that continued even after the mother started using bimodal communication – bilingual<sup>29</sup>.

In this study, it was observed disagreement between the communicative modality of the children from the family member point of view and the point of view from the hearing rehabilitation Service, in analysis to the data from the medical records. The family members characterized the communicative

modality of their children as visual-spatial and not as bimodal.

When the child has oral production, the family member has no difficulty in describing the preferred communication mode of it as speaking, however, when the child uses more than one communication mode, such as vocalization, signs and gestures, it is more difficult for the family to describe the communication mode of the child.

It is understood, also, that the choice of language modality used in the interaction between the dyad family-deaf child may be related to the conception that the family has about deafness, as well as the expectation that will be built on the child. Thus, initially the family can focus on speaking, it is the form of interaction of the hearing society, however, with the interaction process going on, the family will create representations about the linguistic capabilities of the child, which will determine the mode used in the interaction, whether oral or sign. The representation of linguistic possibilities can also vary according to the information that the family acquires about deafness, as well as the experience with other deaf people, which seems to explain the fact that, at times, they give priority to signals, and, in other ones, to speech<sup>30</sup>.

In addition, in the therapy with the speech therapist, the child may use more gestures, since the therapist allows and understands the meaning of the gesture in the child's language development. The therapist is also closer to the child's vocalizations, even if it does not produce words in oral language. Thus, the communication mode that will be described in the charts take into account the child's functioning in the language, but the family cannot have the same perception of the professional. Therefore, a family-centered intervention approach is important to build a collaborative relationship between families and therapists, sharing knowledge to act together.

## Conclusion

The results showed that family members were able to describe the pragmatic skills of deaf children. In the perception of the family most pragmatic skills was present in children, showing that they have communication skills and have conditions to establish a dialogue with an interlocutor.

Related to the pragmatic skills the children showed a higher incidence of skills in the "Res-

ponse to the Communication" section with 83.8%, followed by "Communicative Intent" with 78.8% and "Interaction and Conversation" with 63.3%.

The skills of the section "Change in Context" were present in 79.2% of communicative situations. This shows that on the perception of family, deaf children are able to tailor the communication to the context in which they operate.

The family understood that the preferred communication mode of the children was spatial visual (40.3%), followed by bimodality (18.8%), and auditory oral (15.4%). In the perception of the family members, the communicative mode less used by deaf children was hearing oral. It can be inferred that most of the family realized the vocalizations of children as insufficient to classify as "speech", or oral hearing as the preferred communication mode of children. It is possible that the families' perception regarding oral deaf children did not correspond to auditory and linguistic condition that the children had at the time of the survey. Thus, it is important that speech therapists better guide family members on the development of the deaf child's language, enlightening and signaling on each linguistic and hearing achievement of the child, especially in a late intervention condition as in the study sample.

Finally, to address issues regarding the language and deafness, providing tools for the family on the development of language and hearing, it is possible that they provide data to the speech therapist to better evaluate the pragmatic language. Interventions focused on family can promote ways and means for the involvement in the therapeutic process of the children, being a tool that provides better therapist-family-child relationship.

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