

Alternative Communication Program Readapted to a Kaingang Adolescent

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Abstract: The present study aimed to determine whether the use of the Picture Exchange Communication System - PECS favored the communication of an adolescent from the Kaingang indigenous population with intellectual disabilities and language disorders. To verify the effects of the independent variable a single subject design was performed, which involved two phases: baseline and intervention. The system was readapted considering the social, cultural, moral and religious values as well as the habits and customs of that ethnic group. The results showed that the use of the readapted alternative communication system helped to improve the non-verbal communication of the indigenous adolescent and increased her vocabulary, previously considered very restricted and unintelligible.

Keywords: indians, non verbal communication, language disorders

Programa de Comunicação Alternativa Readaptado para uma Adolescente Kaingang

Resumo: Trata-se de um estudo de caso que teve por objetivo descrever a implementação do Sistema de Comunicação por Troca de Figuras (The Picture Exchange Communication System - PECS) em uma adolescente da população indígena Kaingang que apresentava deficiência intelectual e transtornos de linguagem. Para verificar os efeitos da variável independente foi realizado um delineamento experimental de sujeito único que envolveu duas fases: linha de base e intervenção. O sistema foi readaptado levando em consideração os valores sociais, culturais, morais e religiosos, bem como os hábitos e costumes da etnia. Os resultados evidenciam que o uso do sistema de comunicação alternativa readaptado contribuiu para melhorar a comunicação não verbal e aumentar o vocabulário, antes muito restrito e ininteligível da adolescente indígena.

Palavras-chave: índios, comunicação não verbal, distúrbios da linguagem

Programa de Comunicación Alternativa Readaptado para una Adolescente Kaingang

Resumen: Se trata de un estudio de caso que tuvo como objetivo describir la implementación del Sistema de Comunicación por Intercambio de Imágenes (Picture Exchange Communication System - PECS) en una adolescente perteneciente a la población indígena Kaingang que presentaba discapacidad intelectual y trastornos de lenguaje. Para verificar los efectos de la variable independiente, fue empleado el diseño experimental de un sólo sujeto, conforme dos condiciones: línea de base e intervención. El instrumento fue reajustado teniendo en cuenta los aspectos sociales, culturales, morales y religiosos, así como los hábitos y costumbres de la etnia. Los resultados de este estudio evidencian que el uso del sistema de comunicación alternativo readaptado, contribuyó para mejorar la comunicación no-verbal y aumentar el vocabulario, anteriormente muy estrecho e ininteligible de la adolescente indígena.

Palabras clave: indios, comunicación no verbal, trastornos del lenguaje

The importance of communication from the early years of life is obvious, and its absence may impair cognitive development, family life and the inclusion of the individual in the school, the community and the society. Children who do not develop communicative skills, also present greater learning difficulties, reducing their chances of expressing their feelings and concerns. Communication through language, besides being a complex activity and particular attribute of human beings, is associated with cognitive development, however, some disabilities may drastically compromise the ability to comprehend oral and written expression (receptive and expressive languages). For Cambruzzi and Costa (2007), receptive and expressive communication disabilities can interfere enormously in the performance of a student.

Many people with communication difficulties, not only have their development impaired, but also present aggressive and inappropriate behavior, which is attributed to the difficulty of communicating and interacting with others in the environment in which they live. Children with communication disorders who present problems related to speech or to language will have difficulty achieving the same development as their colleagues of the same age (Coll, Marchesi, & Palacios, 2004).

Environmental factors can reduce or enhance the possibilities of communication through speech. When children have a disability, they are often kept in isolation, excluded from having contact or socializing with others of their age, further impairing the development of speech, because it is within the group that they are encouraged and stimulated to develop their communication. Given the above: what is the language development situation of an indigenous student with below average intellectual performance and unintelligible speech in both languages spoken by her community?

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When the child presents a language disorder, difficulties can be observed in using vocabulary, formulating more elaborate phrases, describing actions, as well as memorizing and recalling words. The disturbance in receptive and expressive language may occur simultaneously and, as a consequence, the child may present difficulties in the comprehension and expression of the language. In all cases where students have difficulty in the comprehension and expression of language, there are probably learning problems, which may lead them to face difficulties in socialization, as well as impairments in their overall behavior. In this sense, according to Deliberato & Alves (2007), alternative communication has value as it gives voice to people who have disorders in oral language, so that they can express their will, thoughts and feelings.

Focusing particularly on nonverbal children with intellectual disabilities, there is a need for specific intervention and stimulation to initiate or develop their communication because, according to Silva (2006), they present difficulties in relation to the acquisition of rules, norms, behaviors, and self-control, among the skills to be learned through social interaction. These difficulties can be alleviated when the child with communication problems and below average intellectual performance receives adequate care to overcome the obstacles inherent to their condition. It is believed that the greatest limitations of the intellectual disabilities are not related to the disability itself, but to the credibility and the opportunities offered to people with intellectual disabilities (Tessaro, 2005).

The individual who, as well as having below average intellectual functioning and severe communication difficulties, lives in a bilingual context due to belonging to a different ethnic group, may have their communication difficulties enhanced, mainly because they have not acquired a mastery of their mother tongue (Cambruzzi & Costa, 2007). For example, in the Ivaí Indigenous Land, where this study was conducted, until they reach school age, the children speak only their mother tongue, Kaingang, which is maintained in the community. However, upon entering school, faced with monolingual teachers who do not speak their native language, they are often unprepared to deal with the ethnic cultural differences (Buratto, 2010).

Due to the natural difficulty of acquiring a second language, these indigenous people have difficulties in the learning process, since learning occurs in a linguistic universe different to their own, in which they have restricted command of the concepts. According to Buratto (2010) in addition to the social, cultural and linguistic differences, the situation of the education of the indigenous population is more difficult when considering people in disability situations, a topic little discussed in Brazil. The specialized educational service is paramount in meeting the specificities of people in a disability situation who, in order to develop themselves, depend on the educational experiences, opportunities and possibilities available to them.

Law No. 7853, of October 24, 1989, states, in Article 17, the mandatory inclusion in the national censuses of

people with disabilities. In the demographic census carried out in 2000 a survey was conducted regarding disabled indigenous people, the data showed that the number of disabled among this population was 17.1%, a figure higher than in the general population (Brazilian Institute of Geography and Statistics [IBGE], 2005). These indices are of more concern in the South and Southeast of Brazil, where the rate increases to 19.5% and 21.7%, respectively. These numbers must be considered in the development of public policies, as indigenous people are more marginalized. The main characteristic of the indigenous populations is their invisibility, the result of centuries of misguided policies to which they have been submitted, which according to Lima and Almeida (2010), culminated in a process of domination that led to a forced cultural assimilation and even the expropriation of their lands with violence. Besides this exclusion, the lack of prospects, the misinformation and the changes brought about and influenced by contact with the non-indigenous society may have collaborated in promoting the situation of discrimination and vulnerability to which they are exposed. Belonging to an ethnic minority, coupled with other difficulties common to the Brazilian population which is characterized by low school performance, is further aggravated when viewed from the perspective of the specialized educational services. Indigenous people with disabilities, especially children and teenagers, are doubly discriminated against: on one hand they belong to a minority ethnic group, on the other, they have disabilities, which puts them in a second disadvantaged group. This double marginalization deprives them of fundamental rights that guarantee their full development. The National Policy on Special Education document from the perspective of inclusive education, of the Ministry of Education (2008, p. 16), guarantees that: "the interface of special education with indigenous, rural and quilombola education should ensure that the resources, services and specialized educational services are present in the pedagogical projects constructed based on the sociocultural differences of these groups". Indigenous people, as Brazilian citizens, are also supported by general legislation such as the Child and Adolescent Statute (CAS) (Law No. 8,069, 1990). However, these rights are neglected and the CAS is one more law among many, which needs actions and partnerships to be effective in practice. The guarantee of these rights encompasses the continued formation of educators and professionals capable of providing information and knowledge so that society can act, be mobilized, demand and fight to guarantee their application.

The fact that children with difficulties in oral communication are excluded, because they can not express themselves, seriously compromises their relationships with other people, excluding them from socializing with society in general. If they had the opportunity to establish interactive relationships, thus being understood by other interlocutors, their linguistic repertoire would be expanded and

many behavioral problems present could be minimized (Walter, 2006).

Augmentative and Alternative Communication (AAC) is gaining increasing importance as a strategy to minimize severe communication difficulties. For Castrogiovanni (2008), the system of Augmentative and Alternative Communication is formed by various components that include symbols, aids, strategies and techniques used for people with serious speech and language problems with the aim of increasing the communicative potential. Currently, there are a number of resources that can facilitate the communication of these people. We can highlight some considered low technology, such as graphic symbols, real objects, miniatures, photographs, communication boards (with symbols, letters, words, sentences), the Eye-gaze, which is a board that should be placed vertically in which the person point to the response with the eyes; as well as the apron, made of fabric with Velcro, in which words or symbols are fixed by the interlocutor. There are also high-tech resources such as computers and communicators with recorded and synthesized voices.

The PECS (Picture Exchange Communication System) consists of the exchange of pictures and was developed by Andrew Bondy and Lory Frost, in 1994 in Delaware, in the USA. According to Walter (2006), it “allows many young autistic children to acquire the ability to communicate within the social context” (p. 15). The system, in its original form, consisted of seven phases: phase 1 - instruction with maximum assistance, phase 2 - increased spontaneity, phase 3 - breakdown of pictures, phase 4 - structuring of sentences, phase 5 - response to the question “What do you want?” phase 6 - spontaneous responses and comments, phase 7 – increase of the vocabulary. In Brazil, in 1998, Walter (1998) adapted the system and synthesized phases 4, 5 and 6 condensing them into phase 4. Thus the Brazilian version was reduced to five phases. The author not only used and adapted the PECS to the Natural Functional Curriculum, in which the goal is to teach knowledge and skills that can be used by the student in different environments (LeBlanc, 1991), but also reduced the number of phases and added some alterations in the environmental arrangement, such as the use of a pouch with the communication album. This procedure was applied by the author with three young people with autism and positive results were obtained, such as the acquisition of a few words or gestures and also the spontaneity to request the desired item in the different practical life situations.

Piza (2002) used the alternative PECS method adapted by Walter (1998) to enhance communication skills in nonverbal people with cerebral palsy and concluded that this system can be used to enhance the communication of individuals with cerebral palsy in various situations. Children with cerebral palsy exposed to such a resource as a facilitator for their communication process started to emit sounds, calling attention to themselves, they initiated communicative interactions, they began to ask for the desired items and started to maintain simple dialogs and to transmit

messages. Charlop-Christy, Carpenter, Le, LeBlanc and Kellet (2002), in California, United States, applied the PECS with three boys diagnosed with autism. The study demonstrated the efficacy of the program with the three individuals and resulted in a reduction in their behavioral problems. Based on the work and on the success achieved by Charlop-Christy et al. (2002), Piza (2002) and Walter (1998, 2000), chose, in the present study, to readapt and reapply the system, in order to check whether it could promote changes in regard to the efficacy in communication and independence, as well as in reducing the aggressivity displayed, in the family, school and community contexts in a non-verbal, indigenous, ethnic Kaingang, adolescent diagnosed with intellectual disabilities.

This study was proposed after verifying the communication difficulties of the Kaingang adolescent in expressing what she wanted and not being understood in the family and school environments, and also after observing that the teacher expressed the desire to find an alternative way to communicate and interact with the participant. This case study aims to describe the implementation of the Picture Exchange Communication System - PECS with an adolescent of the indigenous Kaingang population who presented intellectual disabilities and language disorders.

Method

Participants and Location

One indigenous adolescent 13 years of age at the time of the study. She could not communicate in either of the languages (Portuguese and Kaingang) spoken by the community. When she tried to communicate and was not understood, she would become very agitated and aggressive with family members, peers and teachers. She had been enrolled in grade 1 of the indigenous school for six years, without showing any progress in learning and in communication. She was the fourth daughter of a couple, having three older and two younger siblings. All of whom studied and spoke the Kaingang and Portuguese languages fluently. Furthermore, a teacher participated the study who specialized in special education, had a municipal employment contract, and had worked in indigenous school for more than six years. First, she taught indigenous kindergarten education, then 1st grade and by the time the study was conducted, taught in the 2nd grade. She showed much interest in developing the communication of the student and, under the guidance of the researcher, applied phases 1, 2 and 3 of the readapted system, as will be described below. The teacher who performed phases 4 and 5 of the Program served as the teacher of the 1st to 4th grades in the municipal school network, having a statutory employment contract and educational experience in the Ivaí Indigenous Land. The study was conducted in the Ivaí Indigenous Land, five kilometers away from the seat of a municipality located in the central

region of the state of Paraná, where about 1,200 indigenous people live. The study was first scheduled to be held in three of the school environments (classroom, cafeteria and schoolyard), however, as the student refused to remain in the classroom, the study was restricted to the cafeteria and schoolyard environments, locations preferred by her.

The cafeteria where children receive meals is an annex of the kitchen, measuring 9.3 meters long by 5.2 meters wide, with a table, chairs, a TV and a VCR. The environment is small to accommodate all the students of each class. The cafeteria space is also used for the projection of videos and TV program activities. The main schoolyard has a grassy area 51.6 meters long by 11.1 meters wide and is located between the two buildings, where the classrooms are. These classrooms are attended by students from kindergarten through to high school level, distributed in morning, afternoon and evening classes.

Instrument

The Picture Exchange Communication System (PECS) adapted by Walter (1998). Originally the instrument contained a wooden panel and board and an album of photos with Velcro. Noting that the material would not be appropriate for the context of the study, due to its fragility, we opted for making a more resilient version that could be washed. Thus, the material was readapted to be applied with the indigenous adolescent, with a metallic panel and board and all pictures being made 5 x 5 cm, colored and laminated. The illustrations were selected with the support of the family and received a magnetized base, to be placed in a wallet used for credit cards, organized in seven categories. The selection of 35 items was carried out, five for each of the seven categories, which were organized with different and attractive colors in order to encourage memorization and to make them easier to visualize at the moment of finding the desired picture.

In the readaption of the PECS, the culture and language of the ethnic Kaingang were considered, with elements of the ethnic language, and also of the Portuguese language, so that the pictures were bilingual, i.e. with the words in Portuguese and Kaingang. In addition to this instrument a camcorder and camera were used.

Procedure

Data collection. Data were collected and documented on a record sheet according to the model of Walter (2000), specially adapted for this study. Included on the record sheet were: name of the student, sheet number, date, number of attempts to request something, picture requested and form used to communicate (board or wallet with the pictures). The score regarding the support received to request something was from 0 to 3 points: (a) does not use Augmentative and Alternative Communication (AAC) score = 0; (b) physical assistance – taking the adolescent to the panel and pointing at the picture,

score = 1; (c) verbal assistance – asking the adolescent to go to the panel and find the desired picture, score = 2; (d) independence - the student takes the picture without being asked, and uses AAC spontaneously, score = 3.

A formative evaluation was continuously performed throughout all the recording sessions to verify the applicability of the instrument and the need for possible changes in the readaption of the intervention program, as well as the interest and independence of the adolescent in communicating via the readapted PECS. The number of pictures and communicative emissions used by the girl were also recorded on a separate sheet. Given the interest of the teacher and the agreement of the parents regarding the participation of the girl in the research, the teacher underwent training through theoretical and practical lessons. She received the materials and the sheets upon which the performance data of the girl during the intervention sessions were recorded.

The study is based on an AB type design with a single subject, which involves two phases, the baseline and intervention (Almeida, 2003). In the step referred to as the baseline a picture of something much desired by the participant was placed in front of her, then the researcher presented the object of desire and waited for the request of the adolescent, observing how she related to the picture. At this moment no physical or verbal help and no social reinforcement was offered. The whole baseline procedure was filmed on VHS tape. Once the baseline was stabilized, the intervention was started. The recording sessions were performed twice per week, and occurred primarily during the lunch period with an approximate duration of 20 minutes. We chose to carry out the recording in writing, as it was noticed that the camera bothered the student. The criterion for passing to the next phase was the same used in the original and adapted PECS, which is the performance of independence above 80% in two consecutive sessions.

In phase 1, as determined in the PECS system, only one picture at a time was used, not necessarily the same one. The aim was that the participant realized that the picture could be exchanged for something of interest to her. It was explained to the participant how she could communicate through the exchange of pictures and how she could benefit by using the alternative communication. In this phase the presence of two people was necessary. One was positioned behind and the other in front of the adolescent who was sitting at the table where the picture was placed which corresponded to the preferred item that was also on the table, however, out of her reach. When the participant was trying to reach the desired object, the person behind helped her take the picture and put it into the hand of the person who sat in front of her with an open hand. As in the adaptations made by Walter (1998), verbal stimulation - given by phrases such as “Good”, “I understand you!” and questions such as “What do you want?”, “Can I help you?” - was used in this first phase of the study.

Phase 2 aimed to increase the spontaneity. Thus, the metallic board was introduced so that the participant could remove

the picture, choose the interlocutor and make the exchange of the illustration for the desired item. The verbal enticements used in phase 1 continued to be used. The adolescent was instructed to take the picture of the desired item from the magnetized base and give it to the teacher or researcher or the other person to obtain what was being asking for. The participant was encouraged to repeat the name of the desired item in the two languages spoken by the community: Portuguese and Kaingang.

In phase 3, besides the metallic board, the participant received the wallet with magnetized pictures which were gradually being added to. She began to discriminate and to choose, among various relevant and irrelevant pictures, that which represented the desired item, and to perform the exchange and then to return the picture to the board or to the wallet. When she could discriminate more than eight pictures the size of images was reduced. The discontent of the participant with the reduction of the pictures led the teacher and researcher to opt for maintaining their initial size.

In phase 4, the participant had to structure sentences using a small metallic board on which was fixed the picture-phrase "I want" after which was placed the picture of the desired item, which should be given to the interlocutor. The adolescent structured the phrase after the instigation "what do you want?". After making the exchange, the participant should store the pictures in the wallet closing the dialog. In the second moment, so that the adolescent could express her feelings, the picture-phrase "I am" was introduced. Verbal reinforcement continued to be used as in the previous phases.

In phase 5, the participant began to communicate using the pictures in various situations of daily life, forming phrases with them, as well as concepts that were being gradually added to. The verbal reinforcement was maintained, as well as the emission of sounds referring to the pictures, as initiated in phase 2.

Regarding the teacher training, The readapted PECS was first applied by a teacher who worked in the Indigenous Land school where the participant was enrolled and who agreed to participate in the study and also to the terms proposed. The teacher received training through a short course lasting two hours, and was supplied with all materials and instruments that were necessary for the application of the readapted PECS. Slides of the results of studies that prove the efficacy of the system developed by Brazilian and foreign researchers were also presented.

The intervention had to be discontinued in phase 3 as the teacher responsible for the application began teaching in the indigenous school for only one period. The speech therapist of the special school was then trained to continue the work with the participant, however, some days after the resumption of the interventions, the student moved with her family to another Indigenous Land. With the return of the family, another teacher received the training to continue the intervention from phase 4. The second teacher, in the same way as the first, participated in a short course of the same duration, taught by the researcher, in which she was given a handout on Augmentative and Alternative Communication and also all the material used up to phase 3, as well as the material to be used in stages 4 and 5. Throughout the period of the intervention the researcher supervised the work of the teachers in the intervention process and offered advice.

Data analysis. Data were analyzed through the results obtained at each phase and recorded by the teacher and by the researcher. The total points obtained and recorded in each session were calculated and transformed into graphs to verify the performance of the indigenous student in each intervention session. Qualitative analysis was carried out considering the observations of the teacher and of the researcher who had recorded the changes that had occurred in the behavior, in the communication and in the independence of the adolescent, in the family and school environments.

During the performance of the research, interobserver evaluation took place in 25% of the sessions of each phase of the study in order to measure the level of concordance between observers. The adolescent participated in 38 sessions in total and at the baseline two of the three sessions performed were evaluated. The number of sessions evaluated during the intervention was as follows: phase 1 - 2/4, phase 2 - 2/5, phase 3 - 4/11, phase 4 - 4/10, and phase 5 - 2/5. The records of each were made by each teacher and researcher, and analyzed by checking the scores of the attempts for the session observed. The reliability calculation was made by dividing the number of concordances by the number of concordances plus the number of discordances and multiplying the result by 100, according to the formula of Hersen and Barlow (1977). The mean percentage of the reliability indices of the recordings was 97%, with a variation between 93% and 100%, as shown in Table 1.

Table 1
Concordance between the Teacher and the Researcher during the Baseline and Intervention Sessions

Phases	Baseline		Intervention														
			Phase 1		Phase 2		Phase 3				Phase 4		Phase 5				
Sessions	1	3	5	7	8	11	13	16	19	23	25	27	30	33	34	36	
Teacher	0	0	29	41	25	43	16	36	22	44	37	49	42	50	49	52	
Observer	0	0	27	40	24	41	16	37	22	43	36	49	41	49	48	51	
Confidence (%)	100	100	93	97	96	95	100	97	100	97	97	100	97	98	97	98	
Total Mean (%)								98									

Ethical Considerations

The project was submitted to the Human Research Ethics Committee of the Federal University of São Carlos (CAAE 1287.0.000.135-06). After approval and, as the participant came from an indigenous group, considered vulnerable, the project was sent to the National Research Ethics Committee (CONEP), where it was registered and approved (Protocol No. 13502). The participation of the adolescent was authorized by her parents via them signing the Terms of Free Prior Informed Consent.

Results

The performance of the participant was analyzed in each session of each phase of intervention in terms of percentage, frequency of responses in relation to the level of support received, and variation in the number of attempts obtained in the sessions.

Baseline

During the baseline sessions, in accordance with Figure 1, the performance of the participant was zero (0%

correct). The observation records obtained as film footage showed that in the three baseline sessions the student was unsuccessful, i.e. in all the attempts she failed to ask for something of interest to her.

In the first baseline session, in all attempts, the student looked at the item of interest to her and also at the picture, without touching or making sounds or gestures. In the second, she was irritated, she did not touch the object or the picture, she cried out and ran away. In the third she looked at the food and the picture and left the place. After several attempts, she came over, took the food and ingested it without interest in the illustration. In view of the stability of the baseline, the intervention phase was initiated.

Intervention

Figure 1 shows the evolution of the performance of the participant during the application of the PECS readapted to the indigenous culture during the study phases, i.e. during the baseline and intervention.

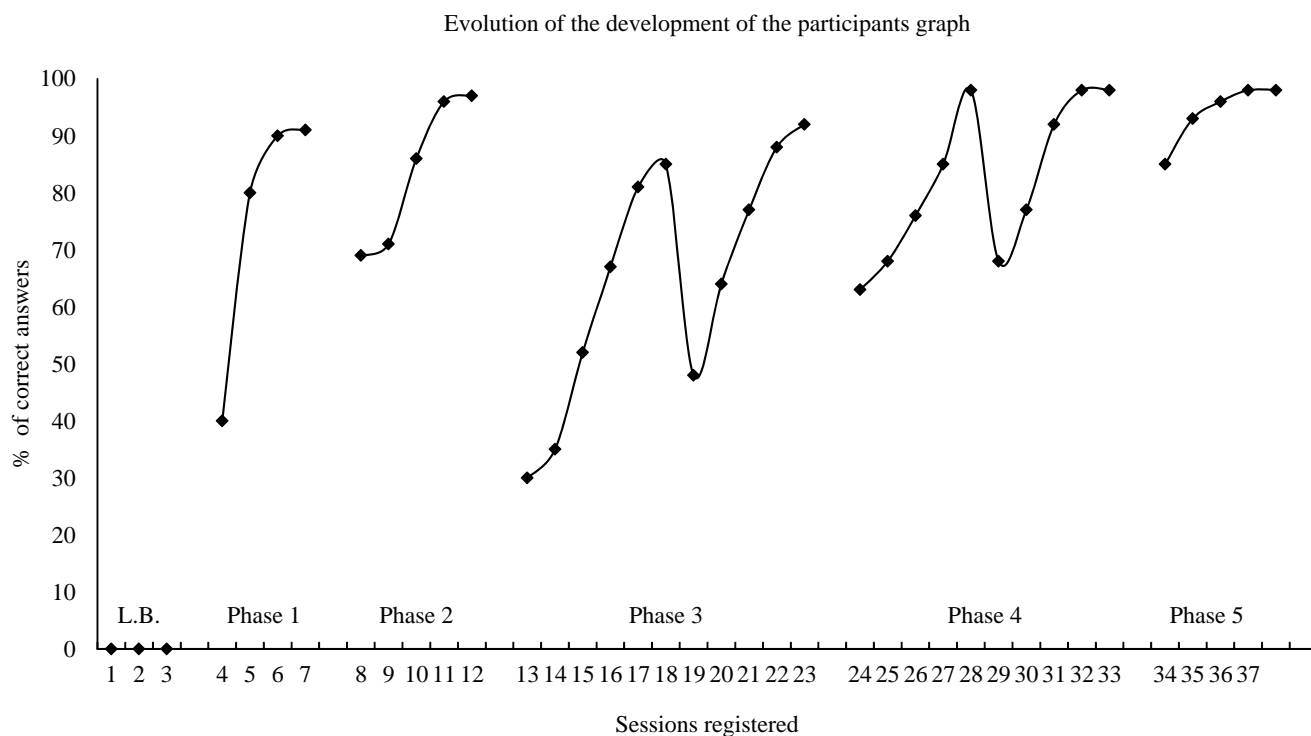


Figure 1. Performance of the participant during the application of the PECS readapted to the indigenous culture in each of the study phases.

Phase 1

When initiating the first phase of the intervention the participant was instructed on how to proceed to make the exchange, i.e. to take the card and give it to the teacher who had her hand extended. The results presented in Figures 1 and 2 show

that the intervention period was initiated in the 4th session, and that phase 1 ended in the 7th session. As shown in Figure 2, in the fourth session 10 attempts were carried out. The participant was unsuccessful in three and was physically helped by the teacher on two occasions, becoming irritated with the physical contact, and received verbal assistance in five attempts.

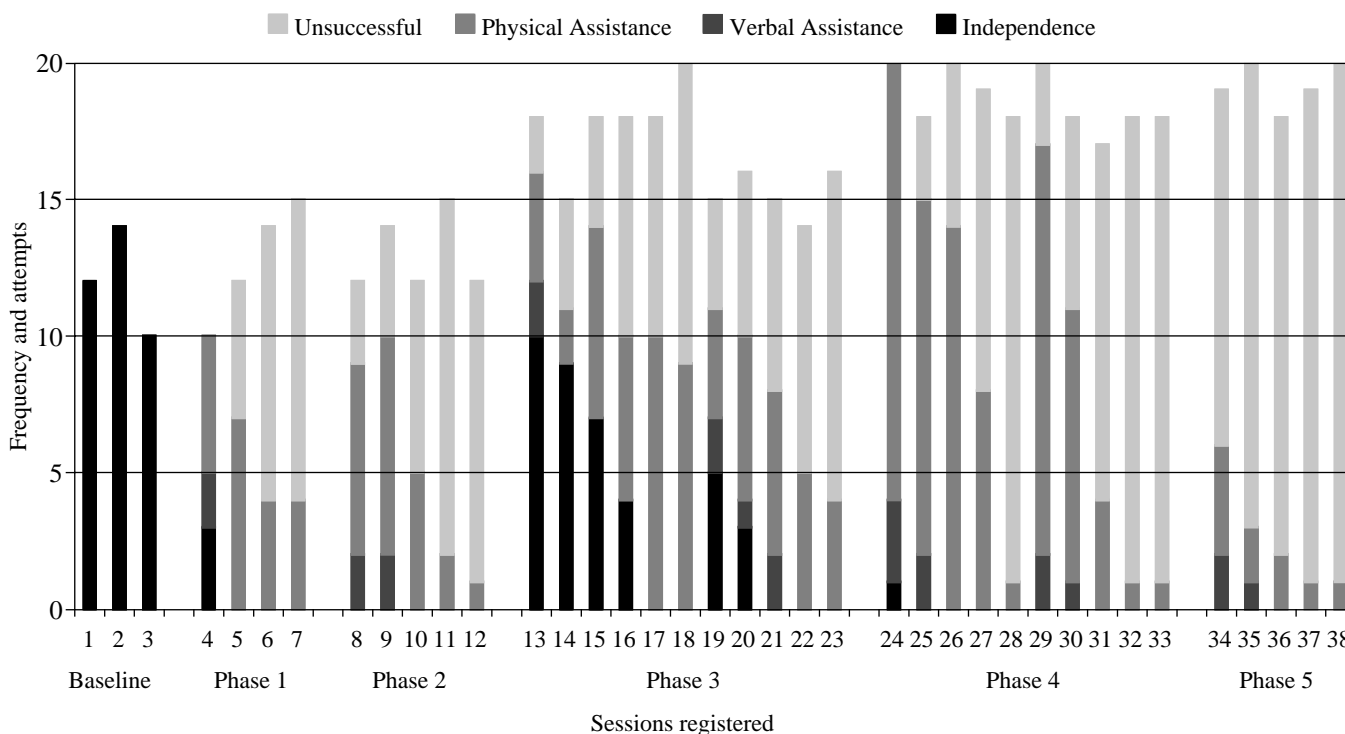


Figure 2. Performance of the participant in relation to the level of support received from the teacher in each session of each phase of the study.

In the 5th session, she showed that she better comprehended how to make requests. In 12 attempts she did not require physical assistance, she needed verbal assistance (Figure 2) in seven attempts and managed to perform five exchanges independently. In the 6th session she further improved her performance, achieving 90%, requiring only verbal assistance in four attempts and managed to request the desired item independently in ten of the fourteen attempts. In the 7th and final session of phase 1 the rate remained virtually the same, demonstrating independence in 11 of the 15 attempts, requiring verbal assistance on four occasions at the beginning of the session.

Phase 2

With the attainment of stability of over 80% in two consecutive sessions, phase 2 of the readapted PECS was initiated in the 8th session, which consisted of increased spontaneity and the search for a teacher, researcher or other person to request the desired item from. Faced with the new situation, that is, to remove the magnetized picture from the metallic board and to search for the teacher or researcher to effect the exchange of the picture for a desired item, the performance of the girl declined and the value obtained was 69%, needing physical assistance in the two first attempts and verbal assistance in seven attempts. The participant demonstrated independence in only three of twelve attempts. She showed a slight improvement in the 9th session, achieving 71%. In the three subsequent sessions, she did not need any more physical assistance, only verbal assistance and the spontaneity and

independence index gradually increased to 86% (10th session), 95% (11th session) and 97% (12th session).

Phase 3

With the gradual improvement and the performance above 80% achieved in three consecutive sessions, phase 3 of the readapted PECS was initiated in the 13th session, which was to discriminate desired pictures from those unwanted, irrelevant and unknown. The participant must first choose between two pictures, one being much desired and the other irrelevant. Besides choosing the illustration of the desired item, she should also make the exchange and return the picture to the metallic board. When presented with improved performance other pictures were gradually added. Thus, in the 13th session, the participant was unsuccessful in ten of the eighteen attempts. In the first four attempts she left the room, she needed physical assistance in two and verbal assistance in four and made two exchanges, totaling 30% success. In three subsequent sessions, the performance was 35%, 52% and 62%, respectively. The participant achieved 81% in the 17th session, requiring only verbal assistance in ten attempts and performing independently in eight. In the 18th session she managed to make her request spontaneously and independently in eleven out of twenty attempts, achieving 85%.

In the phase called 3B, there was a decrease in the performance of the participant to 48% and 64%, because she did not like the pictures reduced in size, presented in the 19th and 20th sessions; she refused to make exchanges in five of

the fifteen attempts in the 19th session, required physical and verbal assistance in sessions 20 and 21 and showed discontent with the smaller pictures. This led the researcher and the teacher to opt for continuing the intervention with the 5 x 5 cm pictures used from the beginning. The participant returned to making exchanges independently in the majority of attempts, achieving rates of 88% and 92% in the 22nd and 23rd sessions, respectively. At the end of the third stage the family moved to another Indigenous Land. This fact meant that the sessions were interrupted for six months.

Phase 4

With the return of the family, it was necessary to train another teacher and provide all the material again. Phase 4, in which the participant should make sentences using first the picture-phrase “I want” and give the picture of the desired item, was then started. The performance of the student was 63% in the 24th session and 68% in the 25th. She insisted on giving the picture as she did in other phases, needing some physical, but mainly verbal assistance in order to perform the exchange. In the 26th session she obtained 76%, not needing any more physical assistance and achieved 85% in the 27th session. In the 28th session she performed the exchanges independently in 17 of the 18 attempts.

The performance of the participant dropped to 68% in the 29th session with the introduction of the picture-phrase “I feel”, so that the participant could express what she was feeling, needing physical and verbal assistance to express herself through the pictures. In the 30th session her performance was 77%, however, she still needed physical and verbal assistance to find the picture-phrase, but showed independence in seven of the eighteen attempts made. She achieved 92% in the 31st session, requiring verbal assistance in only four of the seventeen attempts made. In the two subsequent sessions, 32 and 33, the value obtained was 98% in both.

Phase 5

In this phase, the participant should use a wide variety of pictures, with concepts of size, color, flavor and shape, in various situations of daily life. In the 34th session physical assistance was needed in two attempts and verbal assistance in four, showing independence in thirteen of the nineteen attempts, achieving a rate of 85%. The performance rose to 93% in the 35th session and reached 96% in the 36th. The participant only needed verbal assistance once in the following 37th and 38th sessions, totaling 98% in these two sessions. Given the stability of the results the intervention ended.

Discussion

In each historical moment, men survive in a given way, have habits, purposes and customs that are particular to the time, the material conditions and the culture to which they belong.

Knowing these ideas is also to comprehend more about mental disability, providing greater clarity on this concept, which, in turn, constitutes the first step towards the implementation of healthcare services to this clientele and research projects in the area (Dessen & Silva, 2000, p. 12).

Although there are very few studies about indigenous people with disabilities it is not difficult to conclude that this is a situation of double discrimination: to be indigenous and to have disabilities. The results showed that the use of the PECS provoked significant changes in relation to the communication of the indigenous adolescent with her interlocutors, which contributed toward her inclusion in the community. The role of the interlocutor is to ensure that these people are included so they can exercise their role of subject in society (Deliberato & Alves, 2007). Other studies have demonstrated the efficacy of the system when applied to people with various disabilities and with expressive language difficulties. According to Paula and Enumo (2007), the fact of not managing to be understood causes many frustrating experiences for people with expressive language deficits.

Walter (2004), who evaluated the effects of the adaptation of the Picture Exchange Communication System with four boys diagnosed with infantile autism, revealed that: “The use of the adapted PECS was peculiar due to the fact that the exchange of a piece of paper, was quickly transformed into a much desired item” (p. 75). Piza (2002), in Brazil, when applying the adapted PECS to three individuals with cerebral palsy, and Charlop-Chrity et al. (2002) in the United States, when conducting the study with three autistic people, highlighted the efficacy of the PECS as alternative communication, used by people with cerebral palsy and autism, respectively.

Before the start of the application of the Program the participant presented great difficulty in communicating, exacerbated by aggressivity when she was not understood. From the replication of the readapted and bilingual PECS, it was found that when using this type of alternative communication the adolescent achieved greater independence in the act of communicating with her interlocutors and increased her vocabulary. According to Deliberato, Paura and Pereira Neta (2007), the use of different systems of augmentative and alternative communication in functional contexts can effectively serve a wide number of people with diverse needs.

Moreschi and Almeida (2009) used the PECS system with ten children diagnosed with intellectual disabilities and, at the end of the study, concluded that the use of augmentative and alternative communication resulted in the development of communication skills, such as conversational exchanges and communicative acts, which led to a significant improvement of the interactions of the participants. Danelon (2009), who examined the influence of the use of Augmentative and Alternative Communication (AAC) resource in the social interactions between people with oral communication

difficulties and their communicative partners, observed expansion in the vocalizations and the emergence of autonomy in the subjects, as well as increased actions related to responsiveness in the interlocutors.

Before the intervention, the participant's gaze was fixed on the people, lingeringly, seeming to expect them to guess her desires. Regarding the individuals with whom she had most contact, she did not hesitate to attack them when she asked for something that interested her and it was not provided, often due to not being understood. After the intervention her aggressiveness reduced considerably. At the end of phase 3, when the study had to be interrupted due to the movement of the participant and her family to another Indigenous Land, the pronunciation of some simple words was already noticed, as well as the attempt to issue phrases, still not very intelligible, but with the intention to communicate.

At the end of the intervention, it was noticed that the PECS program encouraged the participant to express her desires and needs, and the pictures began to serve as an aid to make choices, and to support and encourage the emission of words and gradually short phrases. Although using the two languages at the same time, pronouncing Kaingang and Portuguese words in the same sentence, she managed to maintain short dialogues. There was an appreciable reduction in her aggressiveness and inappropriate behaviors, observed by the family, teachers and researcher. The changes can also be attributed to increased possibilities for communication, benefiting the interaction between the family members, colleagues and community. It must be highlighted that, until the end of 2007, the indigenous adolescent had no diagnosis because, according to the professionals consulted, in Brazil there is no validated evaluation that can be applied with this ethnic group. Therefore, these specialists refuse to perform the diagnosis. However, at the end of the semester, during the intervention, the adolescent was sent to be evaluated by a psychologist, a neurologist and a speech therapist, so that, at the beginning of 2008, she was analyzed by diverse professionals, whose diagnosis registered below average general intellectual functioning, at the request of the parents, the student was then enrolled in a special school.

Final Considerations

To promote real conditions for effective care to indigenous people with any disability is a great challenge, above all when they have their communication restricted and are obliged to coexist with two very different languages, as was the case for the adolescent who participated in this study.

As is known, Brazil is home to more than two hundred different ethnic peoples, speaking over 180 languages. Disability among the indigenous people is a reality revealed by the 2000 Census conducted by the Brazilian Institute of Geography and Statistics (IBGE, 2005), which showed the

existence of indigenous people with disabilities in all the regions of Brazil. However, the difficulties are numerous, mainly due to the lack of public policies to serve this populational contingent.

Intellectual disability occurs in all ethnic groups, thus, there are difficulties in validating tests applicable to the different ethnicities. However, the bureaucracy requires that in order to receive specialized care, it is necessary to have a report attesting to the disability. The results obtained in this study have shown that the use of the low technology, alternative communication readapted PECS contributed so that the participant emitted words and simple phrases in the two used languages of the community, which would occur before in a very restricted form, being difficult to understand.

Besides enhancing the communication of the indigenous adolescent, this study offered her inclusion, making coexistence possible, in a more harmonic way, in the educational and social environment of the community. The indigenous teachers, although sensitized to the issue, do not possess training to provide specialized educational services to those who need them. However, recognizing the importance of the interaction between those different, they demonstrate interest in furthering their knowledge, but encounter difficulties, as there are few studies in the literature, particularly with indigenous populations, which are practically nonexistent. Moreover, the implementation of public policies to serve ethnic groups is still incipient. The historic moment in which we live requires that the work of inclusion is not an option, but a requirement, making the articulation of interinstitutional actions essential aiming for care for indigenous students with special educational needs.

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