

Communication, its disorders and alternative systems for children with autism spectrum disorder

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Abstract

The approach to communication as a psychological and social fact remains valid with controversial nuances, especially with regard to the alterations that can occur particularly in those people who are included in Autism Spectrum Disorders (ASD). The present article deals with the review of some of the most general elements in relation to the causes that originate the alterations in language and communication in people with this disorder, to later go into the particularities of the processes mentioned above, taking into account that alterations in communication are present in this population and form an essential part of the diagnostic criteria that are handled. The authors also take a look at the approaches of different specialists in relation to the application of some alternative communication systems for the education of people with autism.

Keywords: Communication, language, disorders, Autism Spectrum Disorder.

Introduction

Since the last century in 1943 Kanner, an Austrian psychiatrist who lived in the United States, for the first time defined autism after making a detailed description of eleven children, as cases that had peculiar characteristics that marked a difference with other children with psychopathological disorders (Aguar, Mainegra, García & Hernández, 2016).

Since then, various conceptions of autism have been developed in the light of scientific findings and different psychopathogenic approaches, although the essence of the clinical description made more than seventy years ago by Kanner has not been erased.

The terms Pervasive Developmental Disorders and Autism Spectrum Disorders are used to refer to a wide spectrum of neuro-evolutionary disorders, which can present alterations in communication, imagination and socialization (Aguar, Mainegra, García & Hernández, 2016).

By considering autism as a constant, it allows an understanding that, regardless of the differences between one or other subjects, similar alterations appear in people with this spectrum, whether in a smaller or larger proportion, in a number of dimensions or aspects (Chkout, Barban & Gómez, 2011).

The fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-V) of the American Psychiatric Association is currently in force. Experts from all over the world have met to discuss in an organized manner the different disorders that are present in the DSM-IV, thus analyzing the diagnostic categories that are present in order to understand them from different perspectives. In the new edition, autistic disorder becomes the only possible diagnosis in the current diagnostic category Pervasive Developmental Disorders and is now called Autism Spectrum Disorder. It is placed in the category of neurodevelopmental disorders, which also includes intellectual disability, language and communication disorders, attention deficit

hyperactivity disorder, coordination and learning disorders (Aguar, Mainegra, García & Hernández, 2016).

According to Martos and Ayuda (2002), communication disorders are present in the population with Autism Spectrum Disorders (ASD) and are an essential part of the diagnostic criteria used; These were initially described by Kanner (1943, 1946) who dedicated a monographic article in 1946 entitled "Irrelevant and Metaphorical Language in Early Childhood Autism" where he refers that some autistic children present an absence of language, and those who have language make strange use of it, in addition to alterations such as echolalia and the inversion of personal pronouns, among other particularities.

Autism spectrum disorders (ASD) are a group of characteristic conditions with some degree of alteration in communication, behavior, language and a wide repertoire of restricted activities, interests, stereotyped and repetitive behaviors (World Health Organization, 2019).

Taking into account the above, the aim of this article is to analyze the causes of alterations in communication and language of people with Autism Spectrum Disorders.

Development and discussion

In everyday life, and in the context of family, school, work, as well as in the community, human beings exchange feelings, opinions or other information through the spoken or written word. This process has been called communication.

The word communication appears in the Larousse Digital and Cervantes Manual of the Spanish Language Dictionary that the communication, etymologically, derives from the Latin "communicare", which can be translated as "to put in common, to share something", and that can have multiple meanings or meanings. It is a category that has diverse meanings and is not exclusive to a particular social science (Guerra & Cuesta, 2018). Communication processes are actions that

need signs common to those involved that are mediated by rules or agreements established by science.

“Communication is coming to share something of ourselves. That is to say, it is a specific rational and emotional quality of man that arises from the need to get in touch with others, when he exchanges ideas that acquire meaning or significance according to previous common experiences” (Fonseca, 2005).

Communication performs different functions, which are synthesized in the action of controlling the behaviors of the members of a given group. It seeks to develop motivation, in order to encourage the members about what they have to do, whether they are developing adequately, and what can be done to improve performance. In addition, it turns out to be a basic source for social interaction in the satisfaction of this social need, to finally provide information that groups and individuals require to assume responsibilities and make decisions that allow evaluating alternative options that may be presented (Nogera, 2009).

In terms of language skills in people with ASD, there is significant variability, so that in some children it is difficult to develop expressive and receptive language skills, while others (Tuchman, 2001), acquire the formal aspects of language (phonological and syntactic), but not the functional (pragmatic), which is a limitation to initiate or sustain an appropriate conversation. In communication, there are also alterations at the age of one (Palomo, 2012). Regression of previously acquired communication and language skills occurs less frequently.

Lack of interest in relating is linked to “non-response”. These children, when pressured, may respond with escapism or negative moods. On the other hand, those who are sociable but do not know how to relate can make inappropriate social contacts such as verbal approaches, inappropriate touching, even manifesting aggressive behavior when trying to be friendly. Communicating and asking for help can cause difficulties that can lead to intense emotional outbursts. (Hervás & Rueda, 2018).

Language and communication impairments persist into adulthood and a significant proportion of individuals with autism remain unable to express themselves verbally (Tuchman, 2001).

As is known, the exact causes of the autism spectrum are not yet known, although it is certain that genetic factors are strongly implicated (Barthélémy, Fuentes, Howlin & Jan van der Gaag, 2019).

From different perspectives, an attempt has been made to find a coherent explanation for the difficulties presented by children with ASD in the development of language and communication, which has led various researchers to study structural and functional markers in areas of the brain classically defined as language areas, among which the following stand out (Mulas, et al., 2010; Martos-Pérez, 2006; Benítez-Burraco, 2008; Palau-Baduell, Valls-Santasusana & Salvadó-Salvadó, 2010).

The underlying neural bases of language development failure are not yet known. There are functional and structural neuroimaging studies that have found morphometric differences in the Wernicke and Broca areas, as well as some patterns of inverted or reduced lateralization in the temporal and frontal cortex (Palau-Baduell, Valls-Santasusana & Salvadó-Salvadó, 2010).

Dysfunctions in the amygdala and cerebellum are also included. It is also noted that there is decreased functional connectivity between the anterior and posterior regions of language.

Studies show, decreases in white matter in the corpus callosum and in both cerebral hemispheres, the deficit of white matter affects mainly the left hemisphere (including upper temporal gyrus and Broca's area), so that the delay of neurodevelopment in autism would affect this hemisphere and, consequently, would explain the alterations in language development (McAlonan, Daly, Kumari, Critchley, Van Amelsvoort, Suckling J, et al, 2002; Waiter, Williams, Murray, Gilchrist, Perrett & Whiten, 2005).

Despite the findings obtained, it is noted that, at times, these can be controversial, mainly with respect to the location and direction (increase or decrease), the inconsistency is given among other reasons by the heterogeneity of the ASDs, as well as the techniques or methods used in the research (Amaral, Schumann & Nordahl, 2008).

On the other hand, the results of research with Functional Magnetic Resonance have shown atypical patterns of activation in the areas of language during the performance of different linguistic tasks. In comprehension tasks, the group with ASD showed more activation in the Wernicke area (upper left latent temporal) and less activation in the Broca area (lower left frontal convolution). In addition, functional connectivity, i.e. the degree of time synchronization of activation between the different cortical areas, was lower (Just, Cherkassky, Keller & Minshew, 2004).

It is universally recognized that early intervention well adapted to individual needs is an essential step towards social integration. Therefore, whenever suspicions arise, intervention should be carried out as quickly as possible (Cala, Licourt & Cabrera, 2015).

It is essential to teach children with ASD how to improve communication skills in order to reach their full potential. In that sense, there are many ways to improve these communication skills, however, it is important to understand that the best treatment program is one that begins at an early age, especially in the preschool stage that is adapted to the child's age and interests. (NIDCD, 2020).

By analyzing the peculiarities of the language of children with ASD in relation to receptive language, these children may show an apparent deafness, since they do not respond when spoken to, nor when giving orders, on the contrary, they may react to certain auditory stimuli by being receptive to some sounds and indifferent to others.

The absence of protoimperial (function of changing the physical world or achieving something in it) and protodeclarative (function of changing the mental world of the interaction partner, sharing with him an internal experience), in the last months of the first year and first months of the second year, is one of the most accurate diagnostic indicators of autism in its initial phase, although it clarifies that it is not the only criterion, nor is it necessary at the time of differential diagnosis. (Rivière & Martos, 1997).

Another distinctive feature, which appears early in the expressive language of the child with ASD, is the lack of gesticulation or facial expression, as a means of supplementing or compensating for his or her language deficit when trying to communicate. Gesticulation is dissociated from communication. However, he may use gesture or movement to direct the adult towards his end, but as if the adult were just another object, used mechanically to satisfy his desires (Artigas, 1999). It is often evident that the child holds the mother's hand, directing it towards its goal, without making any visual interaction or communicative interrelationship. A significant aspect, in which there is consensus among the different researchers, is that the alterations in the development of communication in people with ASD exhibit diverse

forms of manifestation, not all the symptoms are present in the same individual, and this is how relatively ideal resources can be located in children, however, deficiencies in their social skills are identified; in children with acceptable social interaction, but with greater language disorders and children with alterations in the linguistic and social aspect.

Generally, children with ASD have deficiencies in using language spontaneously to adequately and complexly regulate their actions. When this use appears, errors are observed in the development of verbal thinking that serves to plan for the long-term future and that goes beyond the limited interests described (Martos & Ayuda, 2002).

The absence of reciprocity in communication has found an explanation in the lack of Theory of Mind (ToM), defining the capacity of development of the human being to intuit the mental states of other people (intentions, beliefs, desires) and therefore to understand and explain the social behaviour observed, which implies being aware of others, favouring an effective human interaction. (Zegarra & Chino, 2017).

In people with ASD, information processing is carried out in a fragmented way, not in a global way, and the constant effort that individuals usually make to search for meaning and significance in everyday events is not present.

Some involve simple commands, which are essentially a process of association between sounds, environmental contingencies, and behavior. Such understanding is often extremely literal and inflexible (Rivière, 1997).

In a considerable number, there is a total lack of expressive language with an absence of both functional and non-functional vocalizations. Functional vocalizations are understood as those produced with communicative intent, while non-functional ones are used for self-stimulation purposes, do not involve meaningful analysis and have no communicative function.

Children with ASD generally present severe language development difficulties in the production of protodeclarative gestures and significant difficulties in understanding language, especially in the emission that requires an analysis of the communicative intentions of the interlocutor. Those children with autism who possess the ability to communicate through the use of oral language usually do so through echolalia (delayed and immediate), with a shortage of creative language. It is also proposed that echolalia language responds to a globalized style of language analysis, that is, the child with autism will use the information he or she receives as a whole, without making an analysis of the different parts of the statement separately, and therefore, will not be able to understand the general meaning (Martos & Ayuda, 2002).

As stated by Rivière (1997), autistic children with echolalia are more likely to repeat expressions they do not understand than those they do understand. According to Sebastian (2015), it is noted that echolalia can be used as a communication strategy. In cases like these, there is evidence of usefulness in echolalia for:

- Help them to process expressions.
- Regulate one's own behavior or communicate with a person.
- Reduce a social exchange.
- Maintain an interaction in situations where the other person is not understood.
- Fulfill other functions such as asking, protesting, affirming or responding affirmatively to a question asked.

Sebastian (2015) believes that they can also use jargon, repeat television commercials or subsequently recite phrases that they have heard before and that do not seem to be addressed to any person or are not appropriate, taking into account the context in which they occur. When people with autism present the intention to communicate, they may not approach or look at the person with whom they are speaking. However, the intent that they want to communicate may indicate other key aspects such as changes in the tone of voice they use, appropriate use of the situation, or constant repetition of a phrase until someone responds.

A typical feature that is revealed in echolalic children is that they do not tend to repeat sounds that are not part of speech, and the ability to repeat short or long fragments of language requires a high degree of mastery in the processing of phonological (speech sounds) and prosodic (intonation and rhythm) aspects, both in the receptive and productive dimensions. It also involves the ability to attend only to speech and not to other environmental noises.

Pronominal inversion is another particularity present in subjects with ASD and consists of difficulties in the use of personal pronouns, characterized by the substitution of you for me and me for you, according to Rivière (1997). This is due to the limitations that people with ASD have in terms of awareness of "themselves" caused largely by the poverty of their experience of interpersonal relationships. An example of a pronominal reversal is: Peter eats, instead of I eat, or he wants soda instead of I want soda.

The characteristics of the voice in a general sense are very variable and manifest in various ways, studies have concluded that children with ASD can produce the voice with the same levels of intensity, tone and timbre as anyone else, however to communicate they can show inflections and changes in phonation, this seems forced which makes it a sound without melodies, without rhythm and without the cadence that helps a speaker to configure the meaning of his message (Chkout, Barban & Gómez, 2011).

Traditionally, the language difficulties of children with autism have been restricted to the semantic (meaning of the sentence and word) and pragmatic (use of language for communication purposes) components. This conception responds to the observations that have been made about the social use of language so peculiar to people with autism. The alterations in pragmatics contrast with an adequate formal structure of language, especially in cases of high functioning.

The language of children with high levels of autism is characterized by difficulties in understanding direct speech events, jokes, metaphors, etc., and the use of rhetorical language poorly adjusted to the interlocutor, deficiencies in the use of deixis, with an absence of mentalist verbs, and the use of abstract words, in addition to little and inadequate use of questions, which tend to be repetitive. (Martos & Ayuda, 2002).

According to Rivière (1997), the way in which some people with autism learn to read is surprising, peculiar and, at times, exceptional. This fact has been related to hyperlexia, a term coined in 1967 by Silberberg and Silberberg to refer to those exceptional abilities to decode read texts, which have been observed in some children with cognitive deficiencies and behavioral disorders.

Some children with autism, usually those defined as high functioning, learn to read and write early and spontaneously, while showing some reading comprehension skills. These children often show a normal intelligence quotient for their chronological age.

Frequently, this access to reading decoding is essentially perceptive, based on the simple association of labels and graphic elements, and

lacks, in the first moments, the truly conceptual character that defines access to reading, this is closely related to the skills that people with ASD have for the analysis, storage and retrieval of information that is processed visually (Martos & Ayuda, 2002).

In any case, it is clear that hyperlexia still arouses enormous controversy and is an inexhaustible source of doubts and questions. For Martos (2001), it can be associated with different degrees of intellectual functioning in terms of IQ, and it does not necessarily occur in people with high functioning ASD, this prestigious researcher also claims the need to continue research into hyperlexia and to provide answers to the questions that are still being asked.

According to Tuchman (2001), deficiencies in conversational skills are also present in those children with ASD who acquire verbal skills, which essentially manifest themselves in how to express certain turns of phrase and understand the subtleties of language, as well as the altered ability to interpret body language. The main problems in this area are centred on:

- Difficulties in starting and changing conversations.
- Persistence in certain topics, even when the interlocutors have moved on to another subject.
- Tendency to repeat the same question, regardless of the answer.
- Difficulties in moving successively from the role of “the speaker” to “the listener”.

The literal interpretation of language is another peculiarity present in people with ASD. The usual use of figurative linguistic forms such as double meanings, jokes, ironies and metaphors, requires an interpretation not “of what is said”, but of “what is meant”, which makes unavoidable the need to understand the mental functioning of the other in order to be part of the exchange of affections, and ideas.

It has been pointed out that children with ASD, even if they understand the words, may well not grasp the intent or message of their interlocutor. For example, the expression “you are a picture of your father” is not understood as the great resemblance between father and son, the person with autism may claim that he is a human being, not a picture, or in the phrase “Mary is a whale” the child with ASD may understand that Mary is a mammal living in the sea, not that she is an overweight woman.

Literal interpretation of paintings and drawings can also be given: example; not understanding why if it is not raining, characters in a comic book use an umbrella as a parachute.

On the other hand, the lack of interpretation and use of non-verbal language also affects the communicative process and can make the overall understanding of the conversation difficult by not interpreting gestures or facial and/or body expressions of other subjects to give meaning or state of mind that they can represent, This has been explained in the light of Right Hemisphere Dysfunction Theory as it plays an essential role in processing visual and spatial information and is closely linked to the expression and interpretation of emotional information, humor, metaphors, as well as aspects related to prosody (volume, intonation, inflection and rhythm).

It is also frequent to use neologisms (creation of invented words only understandable to him/her) or to insert automatically in the speech the verbalization of what he/she is thinking in that instant.

In conclusion, children with a high level of autism who use language show a profile of less delay and severity in the acquisition of the formal components of language, being the pragmatic, semantic and

phonological suprasegmental components those that present greater alteration. On the other hand, those with more severe levels of the autistic spectrum have even more marked and serious alterations in all language components, finding absence or elementary communicative behaviors (Belinchón, Rivière & Igoa, 1992; Hernández, Llopiz, Insua, Fuster-Guillén, Isla, Alcoser, & Díaz-Flores, 2020).

Teaching to communicate through an alternative/enhanced communication system, is a challenge for professionals, its main objective is to develop communication skills that lead to expand opportunities to participate in different activities in which the child is immersed during the day and therefore enrich their quality of life.

Augmentative and Alternative Communication emerged in the late 1950s and early 1960s in response to the needs of individuals who, despite years of exposure to traditional speech treatment, had not developed oral communication (Arteaga, 1999).

The words augmentative and alternative can be combined intentionally, the alternative character is given because when it is not feasible to use or teach the oral code these systems can serve to make up for its absence, making it possible to develop the same functions as an oral language, when they are aimed at supporting, helping the development of an oral code then one speaks of augmentative systems of communication where the objective is to promote the development of the functions of oral language (Regis and Callejón, 2015).

When we consider the convenience of using alternative or augmentative languages (aids that are used in a wide range of situations, from highly structured programs to relatively natural and spontaneous forms) we realize that this type of aid can generate great expectations, but also much reticence in families and professionals. (Villanueva, 2014).

The establishment of alternative/enhanced communication systems is a priority for children with ASD, since communication is seriously impaired and it is a fundamental capacity in the development of every human being, in the establishment of basic communication skills, as well as in the adequate and daily use of those skills they already have, which constitutes one of the first goals of the education developed with these school children.

These systems are defined by Tamarit (1992) as instruments of speech-language therapy intervention for people with various communication and/or language disorders, and whose aim is to teach, through specific instructional procedures, a structured set of non-voice codes that may or may not require physical support, which, through these or other specific instruction procedures, enable representational functions and serve to carry out acts of communication (functional, spontaneous and generalizable), either alone or in conjunction with vocal codes, or as a partial support for them or in conjunction with other non-voice codes.

Today a much broader concept of augmentative communication “... includes all those options, systems or strategies that can be used to facilitate communication for anyone who has serious difficulties in performing speech” (Torres, 2001, p. 23).

It is important to emphasize that the characteristics and needs of the child and his/her family should always be considered, in order to provide the child with the best response to his/her demands (Cuadrado and Valiente, 2005).

For this reason, it is considered useful to refer to the assessment process for making decisions on the choice of an alternative and/or augmentative system offered by Sotillo (1993) since, as the researcher states, the fundamental objective of this initial assessment process is

to decide whether a person can benefit from the use of one of these systems. The assessment is then essential, linked to a long process of gathering information about the child and the environment in which he or she develops.

The first moment, called the previous step, has as its fundamental objective to interact with the child, to find out about his or her particularities, interests, preferred activities, intentions or lack of intentions to communicate. This requires a first approach to the communicative characteristics of the person to be assessed.

It is recommended at this time to design questionnaires and to interview parents, family members and people linked to the daily life of the child to be evaluated.

According to Otero (2019) the phases of the assessment process are

1. Assessment of the child and his/her environment. In this first phase, the following aspects will be analysed:

- Cognitive, social, linguistic and communication skills of the child.
- Communicative needs.
- Disposition and characteristics of the child's family, school and social environment.
- Levels of demands, expectations and collaboration of the people who make up the environment where the child develops.

The areas of cognitive and social development that in the cases of children with ASD have a central importance, as well as a close link with the area of communication and language, should also be considered.

It is noted that it is the speech therapist who will have to consider the need to collect from each of them the information that is relevant to language intervention.

1. Analysis of the Alternative and Augmentative Systems available

In this phase, the alternative and augmentative systems available to the professionals will be taken into account, as well as the material resources they have for their development. It is also important to assess the knowledge they have of these systems, their particularities and application methodology, and to consider the benefits they can bring to the child, depending on his or her needs.

2. Analysis for the selection of one or more technical aids:

It is evaluated if the child needs special instruments, technical aids or strategies to point out the contents of the communication. This phase is of vital importance for people with communication and language disorders with motor impairment. It is recommended that in children with ASD it can be avoided since their motor skills are generally not affected.

3. Assessment of the system or technical aids for a particular user based on their characteristics:

In this phase, the joint strategy proposed is put into practice as an assessment to determine definitively the application of the system or to propose another choice, depending on the results.

4. Final selection of one or more systems or technical aids:

5. At this point the final decision on the system to be used will be made.

The following factors should be considered in the decision-making process:

In relation to the person being evaluated, Otero (2019) states that they exist:

- Cognitive factors: cognitive memory skills, reasoning.
- Motor factors: fine and gross motor skills, autonomy in movement, phono-articulatory motor aspects.
- Communicative-linguistic factors: social and communication skills, receptive language skills, oral-expressive aspects, among others.
- Perceptive factors: auditory and visual skills.
- Curricular factors: ability to learn, methodology that best favors it, motivation, among others.
- Social, environmental and emotional factors: usual environment, reference groups, family relations, leisure distribution.

Regarding the choice of communication system:

- General characteristics of the system.
- Level of abstraction.
- Extent of the system's vocabulary.
- Possibility of multiple uses or versatility.
- Saturation or maximum possibilities of a system.

The system in relation to the user:

- Sensory discrimination: In this aspect it is necessary to evaluate if there is visual or auditory affection with the aim of taking care of the size of the graphic symbols or the language input (in children with ASD this is essentially done by the visual way).
- Teaching and development process.
- Effort-achievement relationship: The level of abstraction of the system should be adjusted to the user's possibilities. It is important not to propose a system whose complexity or difficulty causes rejection in the child with ASD.

Conclusions

The elements of communication for people with Autism Spectrum Disorders and the different ways of stimulating their development with the use of various systems, resources and aids, may have greater chances of success when cultural contexts, individual peculiarities, teamwork as well as the inclusion of the family in these processes are taken into account.

Children with autism who use language as a means of communication have a profile with less delay in the acquisition of formal language components, but there is a greater alteration in the pragmatic, semantic, suprasegmental and phonological components.

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