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Educational Intervention in Social-Emotional Competence in Students with Autism Spectrum Disorders (ASD)

Marina Jodra

Abstract

The core symptoms of Autism Spectrum Disorders (ASD) consist in the presence of difficulties in social communication, flexibility and imagination, in addition to presenting comorbidity with other psychiatric disorders and medical pathologies. This characteristic symptomatology of autism has repercussions on learning environments, which must adapt to them and become inclusive and pleasant environments. This chapter analyzes the social-emotional symptoms of ASD, their direct repercussions on the learning style of these students and their influence on educational environments. Regarding social communication, the socioemotional style and communication characteristics are analyzed in order to understand the need of specific programs for socioemotional development and specific training for professionals. From this perspective, the need to structure environments and activities, reduce and adjust the number and intensity of stimuli or implement emotional stimulation activities, among others, is explained.

Keywords: Autism Spectrum Disorders, socioemotional development, Theory of Mind, educational intervention

1. Introduction

From the first descriptions of cases of people with Autism Spectrum Disorders (ASD), special emphasis is placed on the difficulties observed in the social area. Reading the description of cases made by Leo Kanner [1] it can already be appreciated that this social dysfunction is nuclear in these persons, with observations such as: “none of these remarks was meant to have communicative value. There was, on his side, no affective tie to people. He behave as if people as such did not matter or ever exist. It made no difference whether one spoke to him in a friendly or harsh way. He never looked up at people’s faces. He allowed his boarding mother’s hands to dress him, paying not the slightest attention to her” (pp. 127–128).

Currently, the deficit in the social-emotional area is one of the 2 diagnostic criteria necessary when diagnosing an ASD. In the DSM-5 it appears as the first symptomatic domain together with communication disturbances [2].

For its part, the World Health Organization (WHO) considers that there are persistent deficits in the ability to initiate or maintain social interactions and social communication [3].

One of the main theories in ASD considers that the social–emotional deficit is the result of the various difficulties observed in people with autism in the capacity of mentalization or theory of mind [4, 5]. This deficit implies a difficulty in understanding “other minds”, the intentions, emotions and thoughts of others, also affecting the ability to empathize with other people [6].

The socioemotional deficit in autism could also be explained by the theory of “weak central coherence” [4, 7]. According to this theory, people with ASD tend to have a more fragmented perception of reality, which leads to the development of a socioemotional deficit since the social world is characterized by the demand for rapid integration of contextualized information. Weak central coherence is explained by studies showing low connectivity between some brain regions; this atypical functioning could be the reason why people with autism do not adequately use social cues to understand social–emotional phenomena [8].

Baron-Cohen [9] also speaks of the Empathy-Systemizing Theory to understand the socioemotional profile of people with ASD. This theory classifies people according to empathy and systemizing abilities: Type E, empathy more developed than systemizing (“female brain”); Type S, systemizing more developed than empathy (“male brains”); Type B, similar scores in both empathy and systemizing; Type E Extreme, very high scores in empathy and very low scores in systemizing; and Type S Extreme, very high scores in systemizing and very low scores in empathy. This theory argues that people with ASD tend to score higher on systemizing and lower on empathy, approaching Type S Extreme. This would partly explain the social behavior and cognitive profile of these individuals.

The few longitudinal studies about the progress of emotional competence in people with ASD speak of the influence of IQ on this development [10]. Social context, chronological age, or symptom severity, also has a strong influence on emotional competence [11, 12] but most research studies emotional recognition in isolated laboratory situations. There is debate about whether these assessments possess predictive ability over spontaneous behaviors in natural conditions [13].

2. What do we know about emotional perception in people with ASD?

Within the social–emotional area we can talk about expression, perception, comprehension and response to simple and complex emotions. There is a significant number of studies that defend the existence of a deficit in people with autism in the recognition and understanding of emotions, after comparing them with control groups [12, 14, 15]. Some studies delimit the deficit in the recognition of specific emotions such as fear, sadness or “negative” emotions, showing in general lines less attention towards them [16]. This deficit in emotion recognition is accompanied by a certain lack of interest on the part of people with autism towards the emotions of others, and less attention to social stimuli. In addition, people with autism are less expressive in social interactions, showing more neutral expressions than people with intellectual disability and typical development without ASD [17].

Emotional recognition has also been studied in people with High Functioning Autistic Disorder or Asperger Syndrome, observing an adequate recognition when dealing with simple emotions and a deficient recognition when emotions are more complex [18], when dynamic social scenes are presented to evaluate complex emotions or mental states and less coherence when interpreting emotional events. On the other hand, a deficit has also been observed in identifying and describing one’s own emotions and in other basic skills in social–emotional development such as imitation or joint [19]. In addition to observing a problem in people with high-functioning autism when processing their own emotions, a greater tendency to

have depressive traits and show more negative emotional responses has also been observed [20].

Regarding the ability to respond to the emotions of others, atypical behaviors have also been detected in persons with ASD. Responses tend to be less empathic and less pulsation has been recorded in persons with ASD in response to others' emotions, compared to typically developing persons. In people with intellectual disabilities and autism, less arousal was observed in response to the gaze direction of another person or to dangerous situations [21].

In the specific case of emotion recognition through the face, a dysfunction has been observed in people with autism [22], being for many theorists a core deficit of the disorder. This deficit manifests itself with both static and dynamic stimuli.

In studies with children with autism, less attention to faces and a deficient response to the human voice are observed. In general terms, 1- and 2-year-old children with ASD show difficulties in directing attention to social scenes, both to faces and to the activities shared among the protagonists of the scene. This deficit is central to the later development of language or social skills [23].

Many theorists believe that the deficit in face recognition is one of the first indicators of an atypical development of the "autistic brain" and one of the basic pillars that enable the subsequent development of more complex abilities such as empathy or those that enable social adaptation in adults with ASD and intellectual disabilities [14]. The existence of an evident correlation between verbal ability and the identification of emotions leads to a certain caution when interpreting all these findings.

Studies on mechanisms of rapid extraction of emotional content using facial stimuli have shown a deficit in groups with ASD compared to typically developing groups [24]. Individuals with autism with intellectual disabilities have also shown difficulties in identifying age or gender through the face, when performing face memory tasks, or in detecting small changes in gaze direction.

Along with this deficit in the processing of information through faces, people with autism have also shown different patterns of gaze fixation when perceiving social scenes [25, 26] and faces. In particular, less gaze fixation time was observed in people with autism in the eyes of the face they are perceiving, the eye area being one of the areas that provides the most information about the mental state of others. On the other hand, there are also studies that have observed that people with autism have different patterns when looking at the mouth of the perceived face. In some research, people with ASD who perform worse on emotional recognition tests were shown to look less at the eyes and more at the mouth than those who performed better. In general, people with ASD show greater attention to these areas of the face during face recognition tasks and during face gaze [22, 27]. It has come to be found that decreased gaze fixation on the eyes of the other is a typical response pattern in infants aged 2 to 6 months who are subsequently diagnosed with ASD [28].

3. Phases of development in the theory of mind

In order to study in depth the development of social-emotional competence, it is important to analyze the precursors of the understanding of the mind and, subsequently, to review the development of the Theory of Mind, which can be defined as the ability to understand the knowledge, intentions, emotions and beliefs of other people and, thus, predict their behavior (**Figure 1**).

We could speak of the following skills as precursors to the ability to mentalize:
Joint attention.

Figure 1.
Precursors and development of the theory of mind.

It is one of the key milestones in the development of infant understanding of the mind. It is not until 9 months when joint attention emerges [29, 30], before that the infant is not able to pay simultaneous attention to the object and the adult.

The development of joint attention is considered an important change in cognitive and social development, along with the ability to alternate gaze between a person and an object, follow the direction of gaze or the use of gestures to indicate or point. From this point on, the interactions established by the infant will change significantly and contribute to the later development of social-cognitive and linguistic skills [31].

Intentional non-verbal communication.

Towards the end of the first year of life, the child begins to use gestures with a communicative intentionality, to direct the adult's attention to an event or object. Signaling begins as proto-imperative, with the aim of directing the other's attention to a specific object, and also proto-declarative, to share interest and attention with another person. This declarative function is considered a precursor of Theory of Mind, as it implies that the child conceives of other people as intentional beings with psychological and mental states distinct from his or her own [32].

Understanding actions as intentional.

The ability to differentiate people from objects develops during the first year of life and, during the first months, infants begin to show a greater interest in social stimuli such as faces, voices or human movements [33].

Later, between 9 and 18 months, children begin to understand that people have intentions and, moreover, these intentions may be different from one's own and do not have to correspond to the actual situation [34].

Social reference.

Social referencing refers to the child's understanding that the reference adult attributes positive or negative qualities to people, objects and situations, and that this information is reflected in his or her emotional reactions. From 12 months onwards, children begin to manifest the acquisition of this social referencing [35], and begin to use the mother's emotional expressions to guide behavior.

Symbolic play or simulation activities.

From the second year of life, between 18 and 24 months, children begin to engage in fictional play and develop it until the age of 4 or 5 years. In symbolic play, real identity and fictional identity are decoupled, and this skill is equivalent to the skill needed to perform false-belief tasks [36].

Use of mental terms in spontaneous speech acts.

From the second year of life onwards, mentalistic terms such as "know", "think" or "wish" begin to be used in conversations. More specifically, at 2 years and 4 months, more than half of the children use verbs related to desires such as want and wish. From the age of 3 years onwards, other verbs related to mental states such as think and know begin to be used [37].

As for the main evolutionary milestones in the development of Theory of Mind, we can talk about:

Understanding desires.

By 18 months, children are able to understand that a person may have desires that are different from their own [38]. Between the ages of 2 and 3 years, they begin to understand the relationship between desires and the emotions they trigger, as well as the relationship between desire and action [39].

Understanding the relationship between seeing and knowing.

Between the ages of 3 and 4, typically developing children begin to understand how knowledge is closely related to experience, i.e., they understand the relationship between seeing and knowing [40].

Understanding beliefs and first-order false beliefs.

The ability to understand the difference between belief and reality is critical in the development of Theory of Mind. Between the ages of 3 and 4, children begin to use information about beliefs, true or false, to explain and predict other people's behavior.

In relation to the development of the Theory of Mind, as seen in Module 1, research has focused on studying mainly false belief [41] by means of location change or location change tasks. In this type of task, character 1 hides an object, leaves the scene and character 2 enters and changes the location of this object; when character 1 re-enters, the question is: Where will "character 1" look for the object he/she hid? It is considered that adequately solving this type of task is a marker of the presence of Theory of Mind, since it is necessary to understand that the character has a false belief and to distinguish it from one's own and, secondly, one has to predict the character's behavior from his belief. One of the emblematic location switching tasks is the "Sally and Anne task" [41].

Another type of tasks used to assess first-order false belief are unexpected content tasks, which involve a lower cognitive demand. In these tasks, they are shown a box, such as a box of "Lacasitos", and are asked what they think will be inside the jar, then they are shown the actual contents of the tube, for example a pencil. Subsequently, they are asked to say what they thought was inside the tube and what another child, who had not seen the contents of the tube, would think was inside the tube.

It is commonly accepted that the understanding of false belief emerges around the age of 4 years [42].

Distinction between appearance and reality.

In relation to children's cognitive development, the distinction between appearance and reality was investigated by Flavell and coworkers [43], who investigated this ability using a sponge that looked like a stone. When asked what the object looked like and what it actually was, children under 4 years of age answered the same on both questions, while 4-year-olds were able to distinguish between appearance and reality. These types of tasks are closely related to false belief tasks and have therefore been used on occasion to assess this ability.

Initial understanding of emotions.

The expression and understanding of emotions is crucial to make sense of the social context and to perform coherently and is closely related to the understanding of false beliefs [44].

Its development emerges very early during infant development. Infants at 4 weeks react with a smile when smiled at, by the end of the first year they begin to use the facial expressions of their caregivers to guide their behavior, and at about 2 years of age they begin to use emotional terms such as sad or angry in their conversations [35]. Between the ages of 3 and 4 years, children turn to wishes to explain the emotions of others, so they begin to understand the relationship between satisfying or not satisfying a wish and being happy or sad about it. Between 5 and 6 years of age, children are already able to understand the relationship between beliefs and desires and emotions [45].

Advanced understanding of emotions.

The understanding of more complex emotions such as disappointment or fear, in relation to other mental states, appears between 7 and 8 years of age. The understanding of secondary emotions such as pride, shame or guilt, in which aspects of self-worth are involved, also appears later.

As for experiencing two emotions simultaneously, between 7 and 8 years of age children are able to understand that this can happen with two emotions of the same valence (both positive or both negative), and it is not until about 10 years of age that they are able to conceive that the same person can experience two emotions of opposite valence at the same time.

On the other hand, the ability to distinguish between real emotions and feigned emotions is acquired gradually between 6 and 11 years of age [46].

Understanding second-order false beliefs.

Perner and Wimmer [47] began to study second-order false beliefs, which are those that include a propositional attitude of another person to a first-order belief. An example would be "Mary thinks that John thinks that chocolate is in the refrigerator."

Comprehension of these tasks does not begin to be appreciated until 5 or 6 years of age and is refined over subsequent years [48].

Understanding deception.

In the acts of deception, desires and emotions play an important role; it is a manipulation of information that aims to generate a false belief in another person. This capacity begins to be acquired from the age of 3–4 years, and is definitively acquired from the age of 6 or 7 years [49].

Understanding of verbal communicative intentions.

Both indirect speech acts and figurative language are closely related to the development of Theory of Mind. The most studied aspects have been the understanding of lies and irony. Comprehension of non-literal meanings is acquired around adolescence and figurative language from the age of 8 [50]. As for the comprehension of white lies, it occurs between 5 and 7 years of age and is perfected in later years. Finally, comprehension of ironic messages begins to occur between the ages of 5 and 6 years and improves over time [51].

Typical development		Development in ASD	
Months	Social interaction	Months	Social interaction
2	Turns head and eyes in the direction of the source of the sound. Social smile.		
3	They begin to use the “prolonged mutual gaze” as an acceptance of eye dialog.	3	They tend not to use “mutual gaze” to initiate eye dialog.
6	Extends arms in anticipation of being picked up. Repeats actions when imitated by an adult.	6	Less active and demanding attitude. A minority are extremely irritable. Little eye contact. No anticipatory social responses.
8	Difference between parents and strangers. Plays “give and take” object exchange games with adults. Plays peek-a-boo and similar games with a script. Shows objects to adults. Waves goodbye. Cries and/or crawls after mother.	8	Difficult to calm when restless. Approximately 1/3 are extremely introverted and may reject interaction.
12	Child initiates games more frequently. Assumes active and passive role in turn-taking games. Increased eye contact.	12	Sociability often declines when the child begins to crawl or walk. No distress with separation.
18	Play with other children begins: show, offer, take toys. Solitary or parallel play is still more typical.		
24	Episodes of play with other children are brief and are usually related to gross motor activity (e.g., chase games) rather than sharing toys.	24	Usually differentiates parents from other people, but expresses little affection. May give a hug or kiss as an automatic gesture if asked. Indifferent to adults other than parents. May develop intense fears. Prefers to be alone.
36	Learns to take turns and share with other children. Episodes of prolonged collaborative interaction with other children. Altercations between children are frequent. Enjoys helping parents with household chores. Likes to be noticed to make others laugh. Wants to please parents.	36	Failure to accept other children. Excessive irritability. Failure to understand the meaning of punishment.
48	Negotiates roles with peers in social simulation games. Has preferred playmates. Peers verbally (and sometimes physically) exclude unwelcome children from play.	48	Unable to understand roles in play with other children.
60	More oriented to other children than to adults. Intense interest in making friends. Fighting and name-calling with other children is common. Able to change roles, from leader to follower, in play with other children.	60	More adult-oriented than other children. Often becomes more social, but interactions remain awkward and one-sided.

Table 1.
Development of social–emotional competence in typically developing persons and persons with ASD [54].

Understanding of “blunders”.

Detecting a “gaffe” involves differentiating between the knowledge of the speaker and the listener and understanding the emotional impact that the speaker’s message may have on the listener. This understanding is closely related to advanced social understanding and begins to develop by age 7, with improvement occurring until age 11 [52].

Understanding of other complex mental states.

The understanding of complex mental states includes perception and interpretation through facial expressions, and especially, through gaze. As for the tasks of emotional understanding through gaze, it is observed how it develops between 6 and 13 years of age [53].

Synthesizing everything seen so far, **Table 1** shows a summary of the development of social–emotional competence in people with typical development and people with ASD.

4. Development of intervention programs in the socioemotional area for people with ASD

Like an Everest, snowy, immense, indifferent and distant, autism challenges us. We must do something to be able to accompany in its development the child whom nature seems to have sentenced to a condemnation of inevitable solitude... [55, p. 27].

When developing intervention programs for people with ASD, several aspects must be taken into account. As we have seen so far, these people have peculiar patterns of thinking, communication and social interaction, so educational strategies must be adapted to these individual differences in order to achieve the goals set. To develop these educational strategies it is necessary to have specialized personnel, adapted environments (visual aids), coordination between professionals and between school and home, and most importantly, not to make the mistake of trying to get the person with ASD to have the same socio-emotional development as ours. We must help them to interpret the social cues starting from their mind and not from ours, discovering their needs and not projecting ours on them.

The results of previous research on social–emotional development in ASD suggest that through a correct selection of stimuli, appropriate stimulation and accompaniment and guidance in the processes of social–emotional perception, people with autism can present adequate and functional brain activation [56]. As a result of these observations, and with the emergence of new tools such as tablets or virtual reality, many applications and programs have been developed in recent years that accompany, to a greater or lesser extent, people with ASD in their socioemotional development.

4.1 Assessment of social-emotional competence in people with ASD

The preamble of any social–emotional intervention program for people with ASD will be a first evaluation process of this competence in the person. In order to do so, it is necessary to see which skills within the social–emotional competence we are interested in assessing.

To assess social–emotional competence and the skills that are compromised, we have several instruments that can be very useful, in addition to traditional diagnostic tests such as the ADI, M-CHAT, ADOS, etc., since these disorders are characterized by the presence of dysfunction in social–emotional development. Some of these assessment instruments are listed below (**Table 2**).

Name (Authors)	Skills assessed
The Sally and Anne Experiment [41]	Understanding 1st order false beliefs
Task of the “Smarties” [57]	Understanding 1st order false beliefs
Autism-Spectrum Quotient (AQ) [58]	Social skills (items 1, 11, 13, 15, 15, 22, 36, 44, 45, 47, 48), attentional change, communication, imagination and attention to detail.
Faux Pas Recognition Test [59]	Understanding “blunders”.
Reading the Mind in the Eyes Task (Revised, Adult Version: RME-R) [58]	Understanding complex emotions and states of mind through gaze
Reading the Mind in the Voice (Test-Revised) [60]	Understanding of complex emotions and mental states through the voice
Reading the Mind in the Films Test [61]	Understanding complex emotions and states of mind through videos
Friendship Questionnaire (FQ) [62]	Interpersonal relationships and friendship
Faces Test [63]	Understanding of basic and complex emotions (states of mind) through the face
The EQ [64]	Degree of empathy
Interview on knowledge of interaction strategies with peers with peers (CEIC) [65]	Strategies for interacting with peers
Vineland Adaptive Behavior Scales (VABS) [66]	Communication, daily living skills, socialization, and motor skills.
IDEA [67]	Social relationship, Joint attention, Affective capacity and inference of mental states, Communicative functions, Expressive language, Receptive language, Anticipatory competence, Mental flexibility, Sense of self-activity, Imagination, Imitation, Capacity to create signifiers.
Social Interaction Skills Questionnaire (CHIS) [68]	Basic social, friendship, conversational, emotional, interpersonal problem solving and adult relationship skills.
Facial Discrimination Battery (FDB) [69]	Recognition of emotions through the face
ACACIA [70]	Social and communicative behavior

Table 2.
Socioemotional competence assessment instruments.

In addition to the evaluation instruments already mentioned, this process must be completed with interviews with parents or relatives and observation of the person in natural contexts.

4.2 Development of social-emotional intervention in the person with ASD

The development in social knowledge of people with autism is not achieved, as we have seen, through the means by which others achieve it. The student with autism does not want to learn aspects that have to do with the social world (or that he/she learns it but refuses to express it), it is that he/she does not know or cannot learn it through natural means. Therefore, it is necessary to program the express teaching of this knowledge, avoiding falling into “deficit-centered teaching”.

Intervention programs for people with ASD should create learning environments to prevent behavioral problems and enhance the development of their skills. We must adapt the techniques to the specific needs and learning styles of these individuals. The essential questions to delimit the educational intervention are: what to teach and how to teach?

1. What to teach?

Choosing target behaviors or strategies for teaching. This task is a critical stage in the planning of the educational intervention, where we must determine the moment of development in which we should focus the intervention. Neurotypical developmental psychology is today the most effective basis for finding these objectives. Therefore, the descriptive and explanatory study of how the child builds, in interaction with other people, his social knowledge is a mandatory subject for anyone who has to plan the educational intervention of students with autism. As a guide, **Table 3** shows a brief list of social skills throughout development.

Based on this idea, the milestones of social development will be rescued to determine the areas of socio-emotional intervention, starting at all times from the potential and motivations of the individual.

2. How to teach?

It is necessary to talk about the need for structuring, predictability, coherence and systematization of teaching as something basic for the student with autism to learn. We could say that the intervention has to go from a high degree of structuring, through the use of visual anticipators, to programmed destructuring (depending on the individual's level of development), which is closer to natural social environments (where the cues are, as we will remember, subtle, complex, transient and varied).

Age	Developed areas
Before 3 years of age	<ul style="list-style-type: none">• Joint attention• Non-verbal intentional counseling• Understanding actions as intentional• Social referencing• Symbolic play• Use of mental terms in spontaneous speech
3–4 years	<ul style="list-style-type: none">• Understanding of desires• Understanding of the relationship between seeing and knowing• Understanding of 1st order beliefs• Distinction between appearance and reality• Initial understanding of emotions
4–14 years	<ul style="list-style-type: none">• Advanced understanding of emotions• Understanding of 2nd order beliefs• Understanding of deception• Understanding of “blunders”.• Understanding of complex mental states

Table 3.
Development of social skills.

Also to be pursued in any learning process is its functionality, spontaneity in its use, and generalization, and all this in a motivational environment. Therefore, the education of the student with ASD requires the realization of a double task: the skill must be taught, but also its use must be taught, an adequate, functional, spontaneous and generalized use.

Finally, the best learning system for the student with autism is that of learning without error, in which, based on the aids provided, the child successfully completes the tasks presented to him/her. Afterwards, and little by little, it is necessary to achieve the progressive fading of the aids up to the highest possible levels, which will be in relation to the level of cognitive development.

Two key objectives when building educational environments for social-emotional development will be:

- Eliminate the barriers that the person has to interact with other people (just as architectural barriers are demolished we must demolish the social barriers).
- Accompany the person with ASD in the understanding of social acts.

As in any educational context, the aim is to promote and encourage maximum personal development to achieve the highest possible quality of life.

5. Conclusions

People with ASD have a specific socio-emotional profile that forces us to design educational interventions in coherence with their needs. It is often taken for granted that any child will naturally acquire all the skills related to the social world without support, but this is not the case for students with ASD and they must be accompanied in this process.

In order to design quality interventions, it is essential to know the explanatory theories of autism. In relation to the socio-emotional profile, we need to know the development of the Theory of Mind and the capacities involved. This needs to be accompanied by an individualized assessment of the person, which helps us to answer two core questions; what to teach and how to teach it?

Conflict of interest

The author confirm that she has no financial or nonfinancial conflicts of interest.

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