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Lost in the Social World: How Social Cognitive Deficits Affect Social Functioning of People with Asperger Syndrome

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1. Introduction

Were we to visualise autism spectrum disorders as a continuum, Asperger syndrome (AS) would be situated at one of its extremes. What appears to determine each individual's position in this continuum is his or her symptomatology. In the case of AS symptomatology presents itself more discretely. According to Barthélemy (2000), the abovementioned symptomatology can be grouped in three major areas: a) difficulties in development of social interaction; b) difficulties in verbal and nonverbal communication; and c) presence of fixated interests, routines or rituals and repetitive behaviours. Being a developmental disorder, symptoms vary according to age. While some features tend to disappear with time, others only appear in a posterior stage of development and the changes can be spectacular (Frith, 2006). Citing Frith (2006, p. 16), "the autism affects the development, as well as the development affects autism". Besides the variability on behaviour, there is also great diversity at a cognitive level, which can range from a medium or superior level of intelligence to profound mental retardation. Approximately 60% of autistic children present an Intelligence Quotient [IQ] under 50; 20% between 50 and 70 and 20% above 70 (Ritvo & Freeman, 1978). More recent data points to the presence of mental retardation in 75% of the cases (Barthélemy, 2000). The existence of a normal level of intelligence (IQ above 70) is the variable that distinguishes classic cases of autism from those considered as the "High Functioning Autism" or the person with AS.

However, it is not yet clear if there are significant differences between "High Functioning Autism" and AS from the point of view of cognitive and behavioural profile. According to the working group that is preparing the fifth edition of DSM-V (American Psychiatric Association [APA], 2010), the current field of research reflects two views: 1) That AS is not substantially different from other forms of 'high functioning' autism; i.e. Asperger's is the part of the autism spectrum with good formal language skills and good (at least verbal) IQ, noting that 'high functioning' autism is itself a vague term, with underspecification of the area of 'high functioning' (performance IQ, verbal IQ, adaptation or symptom severity); 2) That AS is distinct from other subgroups within the autism spectrum: e.g. Klin et al. (2005) suggest the lack of differentiating findings reflects the need for a more stringent approach, with a more nuanced view of onset patterns and early language.

Additionally, several studies have pointed to the non-existence of distinctive criteria at a cognitive and behavioural level to differentiate between these two clinical conditions (Manjiviona & Prior, 1999; Miller & Ozonoff, 2000; Ozonoff, South & Miller, 2000). Some researchers defend that what distinguishes a person with 'high functioning autism' from another with AS is the presence (High Functioning Autism) or not (AS) of a delay in the development of language in childhood. Since this criterion is not very significant in terms of cognitive and behavioural profiles (that is similar in both groups) and since there is still no consensus in scientific literature whether these two designations are referring to a unique disorder or not, in the present work we will only utilize the term AS to designate the group of people that belong to the autism spectrum disorder that have a normal or above normal IQ, independently of the delay in language development in childhood.

Now focusing on AS, we can say that one of its characteristic features is social impairment, but social cognition, or the ability to understand the social world around us, appears to be also affected. Nonetheless, the relationship between social cognition and social functioning in AS still remains unclear. The aim of this chapter is to describe the concept of social cognition, analyse how different aspects of the concept may be affected in AS and explore how social functioning may be impaired in this clinical condition. Possible connections between these two types of impairment will also be examined.

2. Social cognition in Asperger syndrome

In general terms, social cognition is related to the way each person understands and interprets social situations, i.e. it involves the information that is perceived from the world around us, the interpretations that we make from this information and the way we react to the social world in accordance with that initial interpretation. One of the most complete and utilized definitions of social cognition is given by Brothers (1990) and refers to the mental operations underlying social interactions, which include processes involved in perceiving, interpreting and generating responses to the intentions, dispositions, and behaviours of others. According to Striano & Reid (2009), social cognition involves our ability to predict, monitor, and interpret the behaviours and mental states of other people.

Social cognition includes various domains, such as emotional processing, theory of mind (ToM), social perception, social scheme, and attributional style. Emotional processing refers broadly to aspects of perceiving and using emotion. Emotion perception has been the most extensively studied social cognitive process and refers to the ability to infer emotional information from facial expressions, vocal inflections, or the combination of both (Horan et al., 2008). Theory of mind refers to the ability to understand that others have mental states that differ from one's own and the capacity to make correct inferences about the content of those mental states. Processes typically associated with theory of mind involve the ability to understand false beliefs, hints, intentions, metaphor, and irony (Horan et al., 2008). Social perception refers to a person's ability to judge social cues from contextual information and communicative gestures, including awareness of the roles, rules, and goals that typically characterize social situations and guide social interactions. Social perception can also refer to one's perception of relationships between people, in addition to perception of cues that are generated by a single person (Fiske, 1992). Social scheme is linked to social perception and refers to the ability to identify the components that characterize a social situation. The identification of social signs requires knowledge of what is typical in a social situation. It is the social scheme that determines how to act, what is our role and the role of others in a

social situation and what are the rules that should be followed and the goal of that situation (Ruiz et al., 2006). Finally, attributional style refers to how individuals characteristically explain the causes for positive and negative events in their lives (Horan et al., 2008).

In our daily routine we are constantly using social cognitive processes because we depend on them to feel socially situated, to understand social situations and others, to take perspective and to understand what others are expecting of us. All this seems extremely simple and normal. Nonetheless, things are different when social cognition is affected and AS is a disorder where this is very much so, with considerable deficits in emotional processing, social perception and theory of mind.

2.1 Emotional processing

It is important to analyse two aspects: 1) to understand how people with AS process emotions, and 2) to present studies that have been developed dealing with face processing that can explain difficulties in emotional processing in AS.

Different diagnostic criteria of AS describe, clinically substantial difficulties for comprehension, expression and regulation of emotions, e.g. lack of social and emotional reciprocity (APA, 2002); social and emotional behaviour inadequate for the social situation and limited facial expression that is inadequate for the situation (Gillberg, 1991); difficulties in perceiving feelings and emotions in others, limited facial expression and inability to read emotions through facial expressions, as well as transmitting messages through gaze. It is also common for people with AS to have a limited vocabulary to describe their emotional state, mostly when the emotions are more complex (Attwood, 2009). Most studies that have been carried out on emotional processing in AS have focused on the identification of basic emotions and the results have been contradictory, with some authors saying that there is a difficulty in recognizing basic emotions through facial expressions, voice tone or both (Celani et al., 1999; Deruelle et al., 2004; Hobson 1986a, 1986b; Kuusikko et al., 2009; Loveland et al., 1995; Macdonald et al., 1989; Yirmiya et al., 1992) while others maintain that there are no difficulties in this area (Baron-Cohen et al., 1993; Boucher et al., 2000; Grossman et al., 2000). On the other hand, studies that have evaluated the identification of more complex emotions have demonstrated a greater and more consistent evidence of the difficulty to recognize these types of emotions (Attwood, 2009; Baron-Cohen et al., 1999; Baron-Cohen et al., 2001; Capps et al., 1992; Golan et al., 2006; Golan et al., 2008; Happé, 1994; Shamay-Tsoory, 2008; Yirmiya et al., 1992).

The emotions and feelings of other's are interpreted either through voice tone, or through facial and corporal expressions (Kuusikko et al., 2009). We will focus only on facial expressions to introduce the second question, face processing. People with AS have difficulties in reading facial expressions because they process faces as they do objects and they seem to pay attention only to the individual components of a face, which affects the interpretation of emotional expression. Face processing can be described as the central source of information about the emotion and the ability to recognize the emotional state of others requires the ability to pay attention and to focus on relevant information (Kuusikko et al., 2009). Typical errors in AS are, on the one hand, not distinguishing between which keys are relevant and which are not and, on the other, wrongly interpreting those keys. Several studies using advanced technology such as eye-tracking to evaluate visual attention to faces, have reported that people with AS show reduced attention to eyes, which is the region of the face providing more information about the expression of different emotions (Baron-

Cohen et al., 1997b; Bassili, 1979; Calder et al., 2000). This has also been reported in a case study of a 15-month-old baby (Klin & Jones, 2008). Chawarska & Shic (2009) verified that AS children moved away their gaze from faces progressively with age, and they did not focus their gaze on relevant regions of faces (like the ocular region), focusing more on external characteristics. Similar conclusions were reported in several other studies (Freeth et al., 2010; Klin et al., 2002b; Pelphrey et al., 2002; Speer et al., 2007). With regard to the use of facial information to infer emotions, Spezio et al. (2007) verified that people with AS use more information from the mouth rather than the eye region to infer emotions. Other studies have reported that people with AS are less capable than people with typical development of inferring information from the eyes of another person (Baron-Cohen et al., 1997a; Baron-Cohen et al., 2001). Hence, using information transmitted by the eyes to know what another person is thinking and feeling, poses problems for people with AS. On the one hand, they do not look very much in the eyes of other people. On the other, when they are capable of establishing eye contact, the interpretation that they make about the information provided from the other person's eyes is not very efficient (Attwood, 2009). In the light of these studies about emotion identification and face processing, it is important to reflect on the possible relationship between emotional processing and face processing. Considering those studies that report deficits in face processing and postulate that people with AS tend to focus their gaze on external characteristics, not paying much attention to faces and that when they do pay it, tending to focus more on the mouth rather than the eye region and knowing that the eye region is the richest in information about emotions that are transmitted through faces, we can venture that the deficit in processing emotions can be due to inadequate face processing. To conclude, it is important to establish what implications these deficits have (whether in face processing or in emotion processing) in the life of a person with AS. If such a person cannot understand the emotions that are expressed by the people around her, she surely cannot know how to react to those people, because she is not capable of interpreting the signs around her, she does not know what to think, say or do. This being the case, it is very common for a person with AS to think, say and do awkward things that are misinterpreted by others. The person with AS knows when her speech or behaviour is inadequate, and this makes her feel socially incompetent. Being aware of her own difficulties and limitations, the person with AS feels like she does not fit in the social world, and this encourages her to avoid social interaction and leads to social isolation. She becomes closed in her own world, where she knows that no one will bother her and where she can have her desired peace, aware of the confusion inherent in the world of social relationships.

2.2 Theory of mind

As previously mentioned, ToM refers to the ability to recognize and understand what others think, wish or what their intentions are, with the goal of understanding and predicting their behaviour (Attwood, 2009). Several studies have demonstrated that both children and adults with AS present difficulties in the abilities of ToM (Baron-Cohen, 2001; Bowler, 1992; Frith, 2006; Happé, 1994; Kalland et al., 2002; Kalland et al., 2008; Leslie, 1987; Ozonoff et al., 1991; Ponnet et al., 2004; Spek et al., 2010). As Frith (2006) defends, these persons are not programmed to reflect automatically about the mental states of others and present difficulties in "putting themselves into others' shoes" or taking perspectives. For that reason, Baron-Cohen (1995) states that they are mindblind. One of the consequences of

deficits in theory of mind is the tendency to make literal interpretations of everything that is said by others. Metaphors, sarcasm and irony also generate much confusion. This occurs because these people are unable to understand the existing incongruence between what is said and facial expression, voice tone and context (Kleinman et al., 2001; Rutherford et al., 2002). ToM deficits also affect problem solving, due to difficulties in thinking about the point of view and priorities of others, limited abilities in persuasion, a tendency to polarize and to be rigid and inflexible and resistance to changing opinion and decision (Attwood, 2009). Another question related to ToM which affects the daily life of a person with AS is that these people are extremely sincere, putting this above anything else, including the emotions, opinions and feelings of others. People with AS do not know when to refrain from making comments that, although true, may hurt others, and all this is due to the fact that they are not able to infer the mental states of others or “put themselves in others’ shoes”. There are different levels of ToM and tasks have been created to measure ToM accordingly. There are first order tasks, that consist simply of making inferences about the mental states of others, e.g. ‘Where does Sally think her doll is?’, second order tasks, that consist of attributing more complex mental states to others, e.g. ‘What does Sally think that Anne is thinking?’, and finally advanced ToM tasks, that consist of interpreting more complex social situations, based on subtle information (Spek et al., 2010). Children with AS can pass first and second order ToM tasks, but not at the age that was expected. They only can pass them at a more advanced stage of their development (Bowler, 1992; Happé, 1993; Happé, 1995). Adults with AS also do not present difficulties in these kinds of tasks (first and second order tasks) (Baron-Cohen, 2001; Bowler, 1992; Happé, 1994; Ozonoff et al., 1991). But this does not mean that they are able to function adequately in social situations, because in our daily lives we have to face more subtle social information, which is harder to interpret (Ozonoff et al., 1991). Hence, even adults with AS that can pass first and second order tasks of ToM, present difficulties in passing more advanced tasks of ToM (Baron-Cohen et al., 1997a; Baron-Cohen et al., 1997b; Happé, 1994; Kalland et al., 2008; Spek et al., 2010).

Given the above-mentioned studies, it is possible to say that people with AS present deficits in ToM, because at any level of development there is always an inability to pass tasks of ToM in keeping with their stage of development, which means that throughout their development, they will always demonstrate incomprehension of what people around them are thinking or feeling, resulting in their not knowing what to say or how to react to such people.

2.3 Social perception

While people with typical development can notably figure out social cues that indicate the feelings and thoughts of others and can understand these, as if their minds prioritise social cues above anything else, people with AS perceive more information from the physical world than from the social world (Attwood, 2009). Moreover this occurs in very early stages of development. Klin & Jones (2008) reported a case of a 15-month-old infant that suggested that the viewing patterns of the child with autism were driven by the physical contingences of the stimuli rather than by their social context. Studies with older children (around 5 years old) verified that while neurotypical children prefer hearing the voice of their mothers (social stimuli), children with an autism spectrum disorder (ASD) prefer hearing sounds that are not related to persons (non social stimuli) (Klin, 1991; 1992). Similar conclusions were obtained by Mongillo et al. (2008) and by Sheppard et al. (2010). Attempting to explain this preference we can say that the social world appears to be too confusing and difficult to interpret for people with AS. Hence it is much easier to pay attention to non-social

information because this type of information does not need to be deciphered according to some secret code that only people with typical development seem to master. On the other hand, difficulties in social perception can also be related to another question, that is the attention that is paid to social context. People with AS do not use context when processing social stimuli. Beyond having difficulties in utilizing information coming from context during information processing, people with AS invest more time on less relevant characteristics, paying more attention to details than to the big picture (Happé & Frith, 2006; Klin et al., 2002a). All this leads to a deficit in perception of socially relevant stimuli. Linked to this is the concept of central coherence, which refers to the ability to integrate information in context (Frith, 2006). Further to the deficit in ToM and in emotional processing, in AS there is also weak central coherence, i.e. when people with AS are processing information they are excellent at fixating on detail but present serious difficulties in understanding the general perspective or the context (Frith & Happé, 1994). Weak central coherence explains some difficulties felt by people with AS at a social level. Having a weak central coherence means that people cannot easily differentiate between what is relevant and what is superfluous in a social situation. For example, when a person with typical development goes into a large space, where there are a lot of people with a lot of social activity, the brain is inundated with a huge amount of new information, but is capable of identifying and selecting only that which is important and socially relevant. People with typical development have a system of priorities and the usual priority is to focus on people and on conversations and not on the drawing on the rug on the floor or on the decorative flowers or the lights that are illuminating the place. People with AS are less capable of determining what is important in social terms and what is not. Hence, they will probably pay more attention to the rug, to the flowers or to the lights because it is much easier to pay attention to physical stimuli rather than to social stimuli. After the event, people with typical development tend to remember the people, conversations and emotions felt and forget socially irrelevant information. Conversely, people with AS will not remember such detail, but instead will remember a lot of details that other people would consider unimportant (Attwood, 2009). It is possible to distinguish two important aspects of social perception. On the one hand, people with AS present difficulties in perceiving the world around them in a general way, i.e. they can not get the big picture because they prefer to focus on details. On the other hand, looking only at the information they perceive, they prefer to focus on non-social rather than socially relevant information.

All this has implications in the life of the person with AS, because by focusing on socially irrelevant rather than socially relevant information, the person with AS will present difficulties in interpreting social situations and will not know how to react to these. The behaviour of the person with AS will be socially inadequate. Being aware of their social maladjustment, people with AS avoid social contact, preferring to be isolated in their own worlds.

3. Social functioning in Asperger syndrome

3.1 Social functioning on adolescence and early adulthood

In adolescence, teenagers start to become more interested in social relationships and become concerned with being socially accepted in their peer group as well as attaching more importance to friends. This happens with most adolescents, even with those that do not have friends, but would like to, like teenagers with AS (Patrick, 2008). Nonetheless, wanting

to have friends is not the same as knowing how to enter into a relationship (Sicile-Kira, 2008) and this is where we can distinguish a teenager with AS from one without. People with AS do not know how to interrelate and consider this to be extremely difficult. Attwood (2009) mentions that some adults with AS feel that social interactions seem to employ a completely different language, like a foreign language that has not been taught to them by anyone and for which they have no translation. According to Sicile-Kira (2008), things get more complicated because different rules seem to exist according to different social relationships. Given the existence of these different types of relationships, each one with its own set of rules that seems to be obvious to people with typical development but less so obvious to those with AS, the latter has to learn an infinitude of rules and social skills that are suited to different kinds of social relationships (with parents, with friends, with teachers, with neighbours) and to different kinds of social situations (in job interviews, on a date). There are a lot of social interactions that people with AS have to face throughout their lives and each one of them requires specific social skills and it is precisely here where they have difficulty in knowing which one is appropriate for each situation. Learning social skills is an extremely hard and exhausting task for such people because the process consists of multiple attempts and errors, and thousands of misunderstandings occur in interpersonal relations. As Sicile-Kira (2006) points out, AS can be considered a disability of social misunderstandings. These constant misunderstandings lead the adolescent or the adult with AS to see the social world as an ocean of impossible navigation. The unpredictability of the social world is the cause of a constant state of anxiety governing the lives of a lot of these people and that is why many prefer to auto segregate in order to avoid confusion and suffering.

3.2 Social skills

Social skills are the capabilities that we are expected to use to interact with others in our society. They are based on the social norms of our society and tell us what attitudes and behaviours are considered to be normal, acceptable and expected in a particular social situation (Patrick, 2008). Social skills are important because they allow us to interact with each other with predictability, so that we can more readily understand each other and be understood. People who have well-developed social skills are generally viewed by others in their society as competent and successful. They also tend to be well liked by others, while those who struggle to master the social skills are often viewed by society as inept.

Entering adulthood is hard for most people. Nonetheless, it is particularly difficult for a person with AS because living independently requires a lot of abilities that they seem to have difficulties in acquiring, given their special characteristics. This is a propitious moment to start honing social skills. Nonetheless, while adolescents with typical development acquire these skills easily as part of a natural development process, people with AS face far more difficulties at this stage. People with AS fail to learn adequate social skills and this can lead to isolation, feelings of loneliness, frustration, rejection, and poor self-esteem.

According to Patrick (2008), social skills consist of three elements: social intake, internal process, and social output. Social intake refers to our seeing and understanding the words, vocal inflection, body language, eye contact, posture, gestures, and other cultural behaviours that accompany a social message. Internal process refers to our interpretation of the social message in addition to recognizing and managing our own emotions and

reactions. Social output refers to how we respond to the message through our own words, vocal inflection, body language, eye contact, posture, gestures, and cultural behaviours.

Attempting to explain difficulties in social skills felt by the person with AS and taking the above-mentioned elements as a point of analysis, we can say that the person with AS fails early on the first element, that is social intake.

This is related to the fact that they present deficits in social cognition. Information processing is more selective and more focused on details and not on the global context or on the big picture. Additionally, there is a preference for perceiving socially irrelevant rather than socially relevant stimuli. So, if people with AS prefer to focus their attention on physical stimuli (socially irrelevant) and not on social stimuli it is perfectly normal that they will not be paying attention to vocal inflection, body language, posture and to all non verbal communication elements that are transmitted in a social interaction. Since they are not paying attention to this type of information, they fail early on in the first stage of the process of putting social skills into practice. And if there is a failure at this first stage, then it is obvious that everything later in the process will be affected, i.e. the person that does not correctly perceive social stimuli, will not be able to process them at an internal level, so will therefore not know how to adequately react. This results in extremely deficient social skills and lack of adjustment to social situations.

It is a fact that people with AS present a deficit in social skills, but can these be learned? The biggest problem with learning social skills in AS is the fact that these people fail on the application of social rules to daily situations. And this is a very hard task because we live in an age where social norms are changing at a rapid rate and where it is virtually impossible for any human being to know and master every social skill required for every setting, since one way of acting in a specific situation may not be adequate for another one if the context is different (Patrick, 2008).

Nonetheless, a lot of adolescents and young adults with AS can improve their social skills, albeit slowly. Because changes in social behaviour are so difficult, every little gain or advance must be highly valued. Grandin, an adult with AS, asks, "Does this give us an excuse to put aside the effort it takes to function socially? No. It just means that our social learning never stops" (Grandin & Barron, 2005, p.24).

3.3 Communication

Even if a person with AS has exhibited some exceptional abilities at language since childhood, such as using a rich and complex vocabulary, that could include technical terms (usually associated with a particular interest) and some expressions that are used only by adults, these persons also present a lot of difficulties on a communicational level. One of the most visible is the incapability of modifying language in accordance with social circumstances. Pragmatics is the area that studies the use of language in social contexts and this is extremely affected in AS. Another language characteristic of people with AS is prosody, i.e. the melody of speech, in particular, voice tone, that in some persons can sound strange because it is perceived as flat and monotonous. When we hear a person with AS speaking, peculiarities of the tone, inflexion and rhythm of the voice are evident (Fine et al., 1991; Paul et al., 2005; Shriberg et al., 2001). Prosodic function involves three aspects: grammatical, pragmatic and affective. Grammar seems not to be affected in AS. Nonetheless the prosody of people with AS is strange at a pragmatic and affective level (Shriberg et al., 2001) because the speech of these persons does not transmit the degree of social and

emotional information that is expected. People with AS also have difficulties in understanding the importance of voice tone, inflexions or the accentuation of certain words when they are listening to someone else talking (Koning & Magill-Evans, 2001). These subtle keys are very important if we want to identify the different intentions, thoughts and emotions of others. Another speech characteristic that seems to be affected in AS is the volume of the voice, that may be too high or too low for the situation. A too-high tone of voice is extremely irritating to family members and hard for teachers, who are constantly trying to maintain silence in the classroom (Attwood, 2009). As for the fluidity of verbal expression in AS, Attwood (2009) maintains that these people either speak too much or not at all. If the theme is of particular interest, conversation gives way to an authentic verbiage and incessant questions about the topic. In this process of authentic verbiage, it is common that people with AS do not interpret signs that are telling them to stop talking. On the other hand, there are also people with AS that appear mute for periods of time (Gillberg & Billstedt, 2000). This seems to be due to anxiety, which affects verbal fluidity. Sometimes, during a conversation with a person with AS, there are moments when it seems that there has been a malfunction in the communication transmission. The person turns quiet; thinking about what to say next and, in order to get concentrated, avoids looking at the face of the other person. Such behaviour can confound the interlocutor, who is waiting for an immediate answer and begins to wonder if they should interrupt the thoughts of the person with AS in order to re-establish the dialogue (Attwood, 2009).

Normally, people with AS do not like to be interrupted when they are talking, yet they usually interrupt others or continue talking when they should not do so (Grandin, 1995). This normally happens because they are not able to interpret the signs that indicate that they should not interrupt or continue talking. During a conversation between people with typical development, it is expected that the person listening shows signs of paying attention to what is being said and communicates this with gestures and other elements of nonverbal communication. These behaviours confirm the sensation of communication and being in tune with the speaker. These signs of nonverbal communication are less evident when one of the interlocutors is a person with AS. The signs that demonstrate agreement and the sensation of listening with attention and empathising are not present in the communication process of a person with AS (Attwood, 2009). It is also common that, during a conversation, the person with AS frequently changes the topic of conversation, unaware of the fact that the logical connection between themes is not evident to her interlocutor. These conversations, or rather monologues, seem to be unstructured and are perceived by the interlocutor as an offloading of thoughts and experiences without any coherence or relevance to the particular situation. The person with AS is unable to perceive the perspective of an interlocutor who is trying to follow the logic of the conversation while at the same time wondering about the purpose of what is being said. In conversations with people with AS, comments engaging the interlocutor, such as "what do you think about this?" or "have you ever had any similar experience?" are always missing.

Furthermore, people with AS do not follow conventional norms of initiating, maintaining and finishing a conversation. They may start an interaction with a comment that does not fit in that particular situation. For example, a child with AS may come across an unknown person at the supermarket and initiate a conversation saying "do you have a telescope?" then continue with a monologue that shows an encyclopaedic knowledge of astronomy. Once the conversation is initiated, it seems that there is no way of stopping until the child gets to the end of what seems to be a well rehearsed talk about that specific topic. The

person with AS is not conscious of the effect produced by her monologue on the interlocutor and does not perceive the signs of confusion and desire to finish the conversation that are emitted by the other person. It looks as if the person with AS just talks, does not listen and is oblivious to the non verbal signs regulating the flux of communication. During the conversation, the person with AS does not appreciate the context or the social norms. Another difficulty felt by the person with AS arises when the conversation needs to be re-established. When a conversation becomes confuse, the natural reaction of people with typical development is to ask for clarification in order to keep the conversation on the topic. However, a person with AS has doubts about what to say, and does not have the courage to admit this or that she is confused. She remains silent for a long time thinking about what she should say or changes the subject for another one that is more familiar and of interest to her (Adams et al., 2002). Contrary to what happens in their monologues, when people with AS participate in a conversation that is of no interest to them or that has not been initiated by them, they become resistant and do not take part in the conversation, because they consider that they do not have anything to learn with it. Hence, they do not even waste time speaking or hearing what others have to say (Paul & Sutherland, 2003). This is why they appear to have no appreciation of chatting, which does not have a defined goal, because they do not understand its utility (Sicile-Kiran, 2008).

3.4 Communication skills

Communication skills are a set of capabilities that we use to exchange information, thoughts, attitudes, ideas and feelings clearly and accurately. It is through communication that we get the information we need to survive (Patrick, 2008). Communication is made up of the words we use, how we say the words, and our nonverbal communication. The words we use come from our language, how we say the words is determined by the paralinguistic rules of our language, and nonverbal communication is made up of the wordless messages we send through our body language (Windle & Warren, 1999). The speaker to emphasize communication, with the purpose of providing clarity for the listener, uses paralinguistic cues. Communication requires a speaker and a listener. It is the role of the speaker to send a clear and concise message. On the other hand, it is the role of the listener to receive and correctly interpret the message sent by the speaker. In order to become effective communicators, we must develop the skills required by both the speaker and the listener (Patrick, 2008). The speaker must be able to convey a clear and concise message. In order to do this the speaker must have a good command of our language, the paralinguistic cues that support our spoken language, and knowledge of nonverbal communication. She must also be concerned that her message is heard and understood by the listener. It is the responsibility of the speaker to construct the message so that the listener can understand it. This means the speaker must have the capacity to see the perspective of the listener and be able to address his point of view. On the other hand, listening is the key to receiving messages and the listener is the person responsible for receiving the message. Therefore, listening is a combination of hearing what another person says and psychological involvement with the person who is speaking (Windle & Warren, 1999). Listening requires more than hearing just words. It requires a desire to understand another human being, an attitude of respect and acceptance, and a willingness to try to see things from another person's point of view (Patrick, 2008). Listening to understand is a difficult task, which requires specific skills like giving full attention to the other person, observing the other person, and then thinking about what the other person is trying to communicate (Bolton,

1979). Giving full attention to the speaker means that the listener must pay attention to both the verbal and nonverbal message and must attempt to take the perspective of the speaker and try to see the communication from the speaker's point of view. According to Patrick (2008), it is through the language (what is conveyed by words), paralinguistic cues (how we say it), and nonverbal communication (corporal language that accompanies what is being said) that we can understand what the speaker is trying to communicate and that is why we must pay special attention to each one of these aspects.

Firstly, our language is the socially shared and agreed upon system of communication made up of symbols that we use with other people to express and exchange ideas, thoughts, attitudes, facts and feelings.

Paralinguistic cues are the features of our speech that are used to emphasize communication for the purpose of providing clarity for the listener. These features include pitch, loudness, rhythm, stress and intonation of the voice. Paralinguistic cues involve how something is said, not the content of what is said. Pitch refers to the sound of the voice, that can be high or low; loudness refers to the volume of the voice, which can be loud or soft; rhythm refers to the metric pattern of speech which differs within each language, and stress refers to the emphasis placed upon which word is stressed. Paralinguistic cues increase the clarity of the intended message; therefore they are essential for understanding and being understood by others.

Nonverbal communication is the process of communicating by sending and receiving wordless messages. These messages are sent through facial expressions, eye contact, gestures, body language, and posture.

In a study about communication of feelings and attitudes, Mehrabian (1972) discovered that verbal language, i.e. the words that we use, account for 7 percent of all meaning in communication that involves feelings and attitudes, attributing up to 93 percent of meaning to other variables. Paralinguistic cues are one of these variables and account for as much as 38 percent of meaning and nonverbal communication accounts for 55 percent of all meaning when discussing feelings and attitudes. In other words, it is the nonverbal communication that transmits the most meaning.

People communicate through nonverbal communication even when they might not want to communicate. The human body when awake will communicate even without permission. As one of Watzlawick's five axioms of communication states, „One cannot not communicate“ (Watzlawick et al., 1967), because we are constantly communicating, since our body is always sending messages, verbal or nonverbal. Since it is impossible not to communicate, the question that we have to put is: „how should we communicate?“. And we can choose to communicate effectively. To accomplish that, a person must be able to listen as well as to speak, but that is not the end of the story. A person can have the most highly developed language, but unless he or she is able to apply that language to social settings, the effectiveness of communication will be impeded (Patrick, 2008). This is what seems to happen in AS and that is why it is important to analyse which communication skills they have developed and which ones pose more difficulties.

The only communication skill that seems to be well developed in AS is the one that is related to verbal language or to the use of the words, not only with the purpose of transmitting messages, but also in the reception of verbal messages. This communication ability seems to be intact in AS (Tager-Flusberg et al., 2005), because, as mentioned earlier, these people have well developed language and that is why they are able to adequately transmit and receive verbal messages. This being the case, the problem lies with the other

two components of communication that are supposed to accompany verbal messages (Klin & Volkmar, 1997; Paul & Landa, 2008; Tager-Flusberg et al., 2005). People with AS have difficulties in interpreting paralinguistic cues and are unable to pay attention to all nonverbal messages that are transmitted through facial expressions, gestures, and corporal posture. This explains the difficulties felt by a person with AS when assuming the role of listener. Nonetheless, when such a person assumes the role of speaker there are also difficulties, such as being unable to accompany the verbal message with paralinguistic cues and signs of nonverbal communication that can support it. Until now we have seen which communication skills people with AS have difficulty with, nonetheless it is important to offer an explanation to better understand why they have these difficulties. As far as paralinguistic cues are concerned, a person with AS pays no attention to these subtleties of the language, and consequently cannot interpret their meaning. On the other hand, when a person with AS assumes the speaker's role, she does not use paralinguistic cues, because she does not recognize their importance and is unaware that they are useful to emphasize what she is saying in words. The inability to adequately use paralinguistic cues can also be related to typical linguistic problems in AS which have been mentioned earlier, like prosody and lack of rhythm in speech (speaking always with the same voice tone), which makes it difficult to add paralinguistic cues to the speech of these persons.

With regard to nonverbal communication, people with AS present difficulties in interpreting the signs of the nonverbal communication (Sicile-Kira, 2008) that support the verbal message. Conscious of the fact that these signs have a social nature, and taking into account what has been referred to in the previous topic on social perception, we can say that people with AS do not pay attention to socially relevant information, so it is only natural that they do not take notice of facial expressions or the body language utilized by the speaker.

Considering that people with AS do not attend to either paralinguistic cues or nonverbal communication signs, and remembering the Mehrabian (1972) data, the person with AS only understands 7 percent of the meaning of the whole message, because she only interprets correctly what is said by words and does not care about paralinguistic cues and nonverbal communication elements, that together account for 93 percent of the meaning of the message being conveyed.

In the light of these values, we can say that people with AS present difficulties in communication skills, because they cannot correctly interpret a large part of the message that is transmitted in the communication process. Furthermore, these limitations also apply when they are in the role of speaker, but in a different way. If they do not interpret the signs of non-verbal communication in others, it is because they do not value them and maybe do not even notice that they are important in the communication process. Consequently, if their importance is not recognized, emitting signs of nonverbal communication will not be a concern for these people when they are transmitting a message.

To conclude, the messages of people with AS are not accompanied by either paralinguistic cues or nonverbal communication signs. Hence these messages that are transmitted will always be poor in informative terms because they will depend only on the verbal message, i.e. the person only says what she wants to say without emphasizing it either with paralinguistic cues or nonverbal communication elements, such as an adequate facial expression, gestures or a corporal posture depending on what is being said.

In summary, we can say that in the communication process, messages are always misinterpreted by people with AS, as are the messages that are transmitted by these people (poor in informative terms).

Further to the above-mentioned difficulties in communication skills, there is another aspect that is extremely affected in AS, either as the speaker or as the listener in the communication process. This is the ability to ensure that the message is correctly heard and understood by the listener, assuming the person with AS takes on the role of speaker, and the ability to show a speaker that what is being said, is being heard and understood, when the person with AS is the listener.

Both abilities are deficient in people with AS, because they require the ability to take on the perspective of the others and to see things from their point of view. Such skills are blatantly missing in people with AS and are related to the component of social cognition known as theory of mind.

3.5 Relation between communication skills and social skills

Social and communication skills are related through pragmatics. According to Marcondes (2000), pragmatics is the area of linguistics that studies language in the context of its use in communication, studying the existing relations between the signs and the speakers, describing the use that these make of the linguistic in different communication situations. Frith (2006) maintains that pragmatics includes rules for conversations and communication acts. The conversational rules include turn-taking, levels of formality, and topic maintenance. With regard to the communication act, it includes the appropriate rate of speech, pitch, stress, intonation, loudness, quantity of information, quality of information, and directness of the information.

It is pragmatics that sets the rules for the social use of linguistics and it is only when the speaker and listener both have a command of these rules that clear, effective and meaningful communication can occur. All this reverberates at a social level, because when communication is made effectively, social interactions turn out well. Nonetheless, people with AS seem to have difficulties in understanding and following these rules, and this may result in deficient communication and, consequently, affect their social interactions.

As mentioned previously regarding communication and social skills, we could say that, although these two are united by pragmatics, communication skills could be seen as an integrated and necessary element in good development of social skills, inasmuch as the latter seems to be a wide domain of skills which could include the former.

However, although social skills are a wider field than communication skills, this does not mean that communication skills are less important, because they are a necessary and vital element in the good development of social skills. This means that in order to acquire and develop social skills, the person has to first develop communication skills, because if we can not communicate adequately and effectively with others, we will never be able to interact adequately at a social level.

If we follow this logic and apply it to AS, we can say that if a person fails in communication she will also fail in socialization, i.e. if a person presents a deficit at the level of communication skills, her social skills will probably also be deficient. An example of this can be seen in the words of Attwood (2009), when he remarks that problems identified at a communicational level with children with AS inhibit their integration in the schoolyard. On the other hand, having an unusual command of linguistic characteristics can produce other social consequences to children with AS. Other children avoid playing with them and when they do, the child with AS is an easy butt of jokes and ridiculed by others due to her particular way of talking.

4. Relation between social cognition and social functioning

So far three main issues have been addressed. Firstly we have explained how AS fits within the spectrum of autism disorders. Secondly, we have analysed the concept of social cognition having explored in detail the most affected components in AS. Finally, social functioning has been examined focusing on social and communication skills that are affected in AS. So far we have AS, social cognition and social functioning as three isolated concepts. What we need to examine now is how the last two (social cognition and social functioning) can be related in AS.

In actual fact, this has been done when the different components of social cognition were examined, since according to Couture et al. (2006) the relation between social functioning and social cognition depends on the specific area of each one of the analyzed constructs. Generally, we can say that there is strong evidence that there is a consistent and clear relation between social cognition and social functioning. Hence, as each of the social cognition components was analysed and deficits identified, the potential implications of those deficits on the life of a person with AS were also mentioned and those implications always have repercussions on a social level.

Therefore, at this point, where the goal is to establish a connection between social cognition and social functioning, it seems relevant to synthesize the information presented thus far in order to present an explanatory model of social functioning impairment in AS that can be caused by the deficits associated with social cognition.

Beginning with the central coherence theory presented in the section dedicated to social perception in AS, we can see that this central coherence is typically weak in AS which means that these people do not pay attention to information as a whole but to detail.

Furthermore, they focus on non-social more than on social information. For example, a person with AS is capable of paying more attention to a living room lamp [non social information] than to all the social information conveyed by the non verbal behaviour of the person she is interacting with, such as facial expression, voice tone, body posture, and more non verbal communication elements.

Given that people with AS prefer to processes details instead of the big picture and that they also prefer non-social rather than socially-relevant information, when she processes the human face, she does not process it in its totality, focusing more on the region of the mouth and paying little attention to the eye region which is the part of the face that transmits the richest information in terms of emotional expression. Through this, we can again see the difficulty felt by these persons in emotional processing, namely on recognizing emotions. In its turn, this influences theory of mind, i.e., if the person with AS cannot recognize emotions in others, this will also present difficulties in attributing mental states to others.

This happens because if the person with AS does not attend to socially relevant information that is transmitting emotional states, she will not be able to perceive what the other person is feeling or thinking. When this occurs, the person with AS feels „lost“, because she cannot understand or interpret what is being transmitted, and does not know how to respond or react in a world that is unknown and difficult to understanding. Feeling ‘lost in the social world’, it is more than natural that the person with AS presents difficulties on a communicational level. She can use verbal language, but fails in other aspects of communication. Taking an example, if the person with AS cannot infer and attribute mental states to others, she will not be able to maintain adequate communication with other people,

because she has difficulty in knowing what she should say or do in front of her interlocutors. This leads to communication that is either inadequate or undesirable. In turn, these difficulties in communication will reverberate in social maladjustment. This means that the person with AS, conscious of their difficulties in understanding people and social situations and aware of their inability to communicate and to appropriately interact with others, avoids social contact and social relations, preferring to be in their own world, where everything is always the same, where change and unpredictability do not occur and where everything always seems to be easy. When disconnecting from the world that involves them and shutting themselves into their world, people with AS have more time to focus on their themes of interest and feel better because in their world there are predictable patterns and routines to follow that help in their daily routines.

5. Relationship between Asperger syndrome and alexithymia

The term “alexithymia” was coined by Sifneos in 1972. It is derived from the Greek, with *alexi* meaning “no words” and *thymia* meaning “mood or emotion.” Patients with alexithymia have great difficulty or are unable to describe their feelings and can have problems making sophisticated differentiation of one feeling from another. Their communicative style shows markedly reduced or absent symbolic thinking (Taylor, 1984, as cited in Fitzgerald & Molyneux, 2004). As pointed out by Warnes (1986, as cited in Fitzgerald & Molyneux, 2004), these persons “lack the capacity for introspection”, they are preoccupied with the “minute detail of external events (...) and are unable to make connections between events, affective arousal and somatic response”. Nonverbally, they are “stiff and wooden”. They are “mechanical in their object relations”. All of these features also fit descriptions of AS, in which the main difficulties are understanding one’s own and others’ emotions, having problems expressing oneself with nonverbal behavior and in reading that of others. They also have difficulty with “theory of mind” and in predicting the cognitions of others. Their imagination is limited. They tend to have a preoccupation with factual information and are strong in areas such as mathematics, engineering, and computers but can have significant problems with interpersonal relationships. Based on the features of patients with alexithymia and of those with AS, Fitzgerald & Molyneux (2004) defend that, from a clinical perspective, a diagnosis of AS should be considered in patients with alexithymia. According to Fitzgerald & Belgrove (2006) there is significant overlap between alexithymia and AS in various aspects, like cognitive problems, problems with social relationships, speech and language problems, and non-verbal behavior, that is why they emphasise the importance of considering AS in differential diagnosis when psychiatrists are making a diagnosis of Alexithymia.

On the other hand, Hill & Berthoz (2006) suggest that people with AS are likely to show symptoms of alexithymia. This position is sustain by some studies made by these investigators, that report that not all of the persons with AS can be categorised as alexithymic according to their responses to the TAS-20 - Toronto Alexithymia Scale (Bagby, Parker, & Taylor, 1994), that is one the most utilized instruments to measure Alexithymia. Defending this same position, Paula-Pérez et al. (2010) says that clinical experience and research have confirmed that Alexithymia can be recognized in the skills and profile of people with AS.

Silani et al. (2008) examined the inability to identify and distinguish one’s own feelings through the use of alexithymia and empathy questionnaires in individuals with AS,

compared with matched controls. They have found that the groups differed significantly on both alexithymia and empathy questionnaires, what means that people with AS have higher levels of Alexithymia as well as a lack of empathy. This study also shows that Alexithymia and lack of empathy were correlated, indicating a link between understanding one's own and others' emotions.

Although being two different disorders, AS and Alexithymia present similarities, especially at social cognition levels, with huge impairments in emotional processing and in theory of mind. In our opinion, both diagnoses should exist, because AS is a more complex disorder than Alexithymia. Alexithymia can be present in cases of AS, but not all cases of Alexithymia can be diagnosed with AS. So, it is important to have a profound knowledge about these two clinical conditions when clinicians are about to make a diagnoses.

As mentioned by Fitzgerald & Molyneux (2004), there are two important aspects to future studies in this area. One is to investigate directly the relationship between symptoms of alexithymia and autism spectrum disorders, where Asperger syndrome is included, at the behavioural and cognitive levels. The second is to compare directly individuals with ASD who are/are not alexithymic on their behavioural performance on emotion processing tasks as well as in terms of their neural activity.

6. Conclusion

The main conclusions of this work are the following: AS is a developmental disorder characterized by impairments both in social cognition and in social functioning. Social cognition is a complex construct and includes various components. Three of them have been widely studied in AS, namely emotional processing, theory of mind and social perception and the majority of studies reach the same conclusion: people with AS present deficits in all three areas. These deficits seem to have repercussions on a social level, affecting the social functioning of these persons. Hence these people are unable to interpret the emotions of others, infer mental states, consider other people's perspectives and pay attention to relevant social information. Furthermore, they feel lost in the social world because so impaired they are unable to react in social situations and to establish adequate social interactions in a complex world, that is dictated by social rules, that are hard for them to learn. Given this difficulty in learning social rules, it is very difficult for people with AS to learn and acquire social and communication skills, and this is why these skills are so impaired. Social cognition can be a mediator between non social cognition and social functioning, i.e. we believe that people with AS that present good cognitive capabilities but show difficulties in social cognition, can be functioning in a maladjusted way due to their deficit in social cognition components. If we follow this line of thought, we can predict that if we intervene in social cognition for persons with good cognitive abilities, i.e. in persons with AS, we can be contributing to improving social cognition, and expect to see improvements reverberating in the social functioning of these persons. Since interventions aiming to train social skills are not easily suited to persons with AS, our suggestion for future research is to create programs to work and develop social cognition skills, because if social cognition deficits are the basis of social functioning deficits, we think that if we train and develop social cognition skills, this will have repercussions on the social functioning of these persons and improve their social skills. There is one program that has been developed to this end and that has proven feasible in a pilot study with adults with high functioning autism. This is, the Social Cognition and Interaction Training for Adults with high

functioning autism [SCIT-A] (Turner-Brown et al., 2008). Therefore, in future studies, this program and other programs targeting social cognition components should be created and administered to test their feasibility and efficacy in improving social cognition deficits in persons with AS, and to test if improvements in social cognition have repercussions on social functioning improving social and communication skills as well.

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8. References

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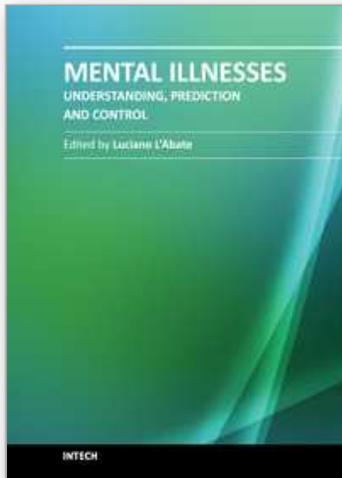
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In the book "Mental Illnesses - Understanding, Prediction and Control" attention is devoted to the many background factors that are present in understanding public attitudes, immigration, stigma, and competencies surrounding mental illness. Various etiological and pathogenic factors, starting with adhesion molecules at one level and ending with abuse and maltreatment in childhood and youth at another level that are related to mental illness, include personality disorders that sit between mental health and illness. If we really understand the nature of mental illness then we should be able to not only predict but perhaps even to control it irrespective of the type of mental illness in question but also the degree of severity of the illness in order to allow us to predict their long-term outcome and begin to reduce its influence and costs to society. How can we integrate theory, research evidence, and specific ways to deal with mental illness? An attempt will be made in the last conclusive chapter of this volume.

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