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Psychotherapy for Adults with Autistic Spectrum Disorders

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Abstract

Objective: This is an unconventional manuscript that attempts to outline a theory of caetextia for adults with autistic spectrum disorders (ASD), based on hemispheric dominance due to impaired parallel processing. To take context into consideration, a person must be able to concentrate on and separate out his attention across different elements of a given situation. This is a process of dynamic sensory integration. Yet the deficits and strategies developed by these patients differ according to whether their dominant hemisphere is the right or the left one.

Method: By looking at two case studies for didactical purposes, we will attempt to interpret these differences and construct a specific therapeutic approach.

Conclusions: The detection of this disability as well as the therapeutic approaches must thus be adapted to this dimension of the disorder. We shall attempt to interpret the differences and design a specific therapeutic plan.

Keywords: Psychotherapy; Adults with autistic spectrum disorders; Context blindness; Hemispheric dominance.

Introduction

In the 1980s, many researchers put forward the hypothesis that a deficit in the theory of mind [1] was responsible for the incapacity to read and predict the thoughts and behaviors of others, a characteristic symptom of autism spectrum disorders (ASD). This theory enabled researchers to explain the absence of empathy and the lack of understanding with respect to the intentionality of others. About ten years later, researchers brought forth a new theory for interpreting autism, a theory called "Central Coherence".

This theory explains that coherence is constructed through the dynamic integration of information in a specific context, which then explains the deficit when the autistic individual must treat highly dynamic information with respect to context [2-6].

Currently, researchers have established that both theories are valid, although only partially, and that we can link them within a new approach—the theory of caetextia or blind context [7,8]. This last theory insists upon the role of parallel functioning of executive functions and of their articulation via the assembly of information coming from the cerebral hemispheres. This functioning will be developed upon later. This theory works from the hypothesis that in order to see context, we must be capable of concentrating on and separating out our attention across different elements (objects and perspectives) of a given scene. We know that mammals developed this cognitive capacity as they evolved [9,10]. This capacity highlights the parallel process of information processing at the level of the cerebral hemisphere that will be developed later. In individuals with Autism Spectrum Disorders (ASD) as they call themselves—decision making does not rely on an integration of all information but on a dominant processing undertaken either by the left hemisphere or the right hemisphere. This explains why adults with ASD are, on the one hand, incapable of seeing the world from several different perspectives and, on the other, unable to recognize within this process the implication of emotions and intentions. It is a question of including these deficits in the prediction of behaviors and dynamic processing. We hypothesize that the representation thus comprised would be biased by hemispheric dominance. In this way, the caetextia of adults with ASD would explain their dichotomous thought, stereotypical behaviors, sensory hypersensitivity, difficulties in abstract thought and with social relationships, as well as difficulties in adapting to unexpected situations.

What is the parallel processing of information and how is it particular for adults with ASD?

Definition: The parallel processing of incoming information is a mechanism of evaluating risks coming from the environment that relies on the integration of multiple streams of incoming information and their comparison with data coming from earlier experiences that are calibrated in a similar manner [11]. It is about evaluating and comparing the costs and benefits of different alternatives. Something which makes it possible to regulate and control behavior in a flexible way in order to optimize responses and to adapt one's actions [12]. This capacity to integrate numerous information flows, to store them in our memory and then use them in an appropriate way, enables a person to give a value to an action, to compare the value of one action with another and to react in the best way in a given situation t.

Structures involved in parallel processing: The current hypotheses on the neurobiological mechanisms involved in parallel processing suggest that the anterior cingulate cortex (ACC), linked to evaluating action, as well as the dorsolateral prefrontal cortex (DLPFC or DL-PFC), linked to cognitive control, interact to regulate behavior [11,13]; the seat of executive functioning located in each hemisphere intervenes as the organism adapts to its environment [14].

The main afferents of the DLPFC come from the mediodorsal thalamic nuclei whose magnocellular part mainly projects onto the medial and orbital prefrontal cortex while the parvocellular part projects mainly onto the dorsolateral region. The prefrontal cortex receives projections coming from the hypothalamus, from the subthalamus,

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from the mesenchephelon and the limbic system, either directly or via the thalamus. The cortical afferents coming from the sensory or motor regions which are not considered primary, and which within the framework of a vast system of interconnected regions seem to contribute to the processing of sensory information. In essence, the primary somesthetic, visual and auditory sensory pathways project first onto the orbital, parietal or temporal regions which relay this information to the prefrontal cortex, thus making it a place of convergence with an associative inter-modality role. The prefrontal cortex projects in return onto the afferent regions excluding the basal ganglions from which it does not receive any direct projections [13].

Cognitive capacities involved: The executive functions designate an ensemble of cognitive processes responsible for inputs and outputs, assuring behavior that is both flexible and suitable. Essentially, these functions regroup capacities linked to anticipation, planning, action control, organization and resolution of a problem, as well as logical reasoning that enables the acquisition of learning rules. "*They actively intervene in the system of rewards in association with other regions of the brain like the orbitofrontal cortex, the aminergic systems like the ventral tegmental pathway (VTA), the source of dopamine, and the coeruleus locus (CL), the area from which is projected norepinephrine over the near entirety of the brain. These various regions involved in the different decision-making processes have specific roles and are interdependent. In this way, understanding the sequences of processing and the functioning of all these cortical pathways in a functioning network is vital* [13]. This region is also involved in emotional management, the selection of responses, visual-spatial processing as well as access to episodic memory.

Information taking: Signal analysis is carried out through categorical (color, contrast, etc.), geometric (shape, length, outlines, etc), and dynamic (movement) segregation. This brain activity is guaranteed through a cutting-up of incoming sensory information. This modularity constitutes basic data and is linked to the functional morphology of the sensory-motor connections that break down the world according to a predetermined directory of properties. This same functional morphology also ensures re-composition, linking, combination, and synthesis. This mode of processing appears to simplify neuro-computation and quickly reduce the complexity of the visual world, something which is vital for guiding action and making decisions [15]. It seems, however, that adults with ASD do not discriminate when processing sensory information [16] and that their difficulty in recomposing the complexity of the world comes from a problem with taking into account different facets of non-integrated sensory-motor connections.

Evaluate and guide action: A situation is new with respect to a person's memory of an earlier situation. In this way the notion of newness is inseparably linked to the notion of familiarity. The movement between newness and familiarity and back again corresponds to a real dynamic of exploration. Essentially, visual exploration is linked to environmental modifications. An environment in which one has never been before is at first new, but visual exploration makes it familiar. The transition from newness to familiarity hinges on the fact that during the course of visual exploration, one integrates and memorizes a certain amount of data. The characteristics of a situation constitute the necessary reference for a later detection of newness [17]. For adults with ASD, establishing familiarity is more difficult because everything seems to appear as new. In this way, the distinctiveness that characterizes a stimulus has two origins. The first would be determined by sensory intensity, for example, size, luminosity, or a sudden and unpredictable movement [18]; the sensory hypersensitivity of adults with ASD increases then this distinctiveness [19-21]. The second origin would be the following. In essence, distinctiveness also depends on the contrast constituted by the detection of un-familiarity. Familiarization is a dynamic process that is translated by the phenomenon of habituation. By definition, habituation is the decrease of response to a stimulus when we are repeatedly subjected to the same stimulus. This doesn't happen correctly with adults with ASD because, as we've said, the process that results in familiarity is a difficult one. Their information processing focuses on parts and details [22]. In essence, autistic perception is slowed down by difficulties in integrating associative regions attributed to a problem of intra-cerebral connectivity [23-28].

These important hypotheses underscore the possibility of the dominant use of one hemisphere over another in individuals with ASD. Pellicano & Burr [29] have stated that the perceptive errors in autism are a proof of the existence of a dominant hemisphere that prevents a result of optimal calculation meant to reduce overall noise. They suggest that autistic individuals have larger a priori which then form rigid internal constraints. These constraints, on the strategy of immediate adjustment of incoming signals, could reduce a person's capacity to anticipate and control [29-31]. Adults with ASD exploit the Bayesian precision that makes it possible to increase perceptive inflows [32] instead of optimal calculations. The weakness of this Bayesian precision is a reduction of adaptation, adaptation in the sense of a dynamic process in which nervous-system sensitivity is permanently recalibrated to estimate the characteristics of one's actual environment. This strategy amplifies recalibration [33-35].

In summary, in autism there is no fundamental difference in sensory processing in and of itself, but there is a specificity (1) in the way in which incoming information is processed and interpreted, and (2) in processing speed [36-39].

Decision making: Making a choice consists of deciding which solution among several possibilities is the most appropriate for a given action. This necessitates an association of an action with a value. During times when a person is exploring his or her environment, these values which we define here as "meaningful for oneself" will be postulated if the actions are known and can be described objectively. This increases planning for consequences. On the other hand, we can also define a value as “appropriate for oneself”. In this context, a value that is appropriate for oneself includes an anticipation of its effect in terms of expected consequences—joy or anger, for example. Overall, several parameters must be taken into consideration in the evaluation of an action [40].

Cognitive control and behavioral regulation: The reciprocal cortico-corticals connections between the ACC and the left or right DLPFC support the hypothesis of the ACC's implication in cognition. The linking of these two regions with the motor cortex and the spinal cord invoke a communication pathway between the cognitive and motor systems [41]. They also support the exchange of information between the two hemispheres and coordinate their functioning.

The ACC also encodes the environmental uncertainty and variability that modulate fidelity in terms of expressing a memorized action: that which we learn cannot be executed without a certain adaptation. Essentially, the suitability of the immediate use of information on the consequences of one's actions varies depending on whether the context is a highly shifting environment requiring a quick adjustment of actions or if, oppositely, the environment is more stable and does not forcibly require a change of behavior at the slightest difference to the expected

reward. Within the framework of a relatively stable context, a heavier weight will be attributed to past results; conduct won't be modified because it will be faithful to the learned model. This uncertainty is correlated to the ACC's bold signal [42-44]. Nevertheless, there is a tendency for exploratory behaviors that entail sacrifice of an immediate known reward for, instead, exploring the environment in quest of a potentially better resource or one that is simply new [45].

Numerous studies have underlined the hypothesis that the neurons of the DLPFC encode behavioral rules [46-48]. In this way, in autism, the inability to have several attention-based regions and to take uncertainty and changing environments into consideration are explained by a default in ACC-DLPFC processing. By considering the previously stated elements, one becomes aware that the particular functioning of the ACC as well as the DLPFC could explain some of the autism-specific characteristics like sensory hypersensitivity, context blindness, biased use of memory with hyperamnesia or amnesia.

This hemispheric over-specialization encountered in autism lies at the origin of the dichotomous thought discussed in diagnostic manuals. Hemispheric connectivity makes it possible to acquire a self of self, metacommunication, and a dynamic integration of memorized, current and expected information [8]. This is exactly what adults with ASD lack. Because of this, an adult with ASD access to introspection is difficult, therefore ineffective, and so psychoanalysis is set to fail. The slowdown of parallel processing for an adult with ASD indicates that his or her reasoning is affected by inappropriate information that gives rise to complexity in communication. This process is slow and because the individual doesn't have instantaneous access, its reconstitution occurs at a later moment.

Left Brain, Right Brain Caetextia

Currently, various authors have reported on "left brain or right brain context blindness" [4,7,8,50,51]. The hemispheres have developed different processes to support rational and contextual thinking. For example, language and thinking are principally governed by the left hemisphere, in such a way to promote reasoning. But our logical thinking is colored by associative thought and the imagination - faculties which come from the right hemisphere. There is thus a parallel and simultaneous processing of different flows of incoming data.

Baron-Cohen [50] has suggested that the left hemisphere, which is responsible for systematic processing, might be associated with masculine thinking, while the right brain, responsible for one's capacity for empathy, would be associated with feminine thinking. In 2002, he hypothesized that adults with ASD suffer from a dominance of the left hemisphere. At that time, he did not suggest that an adult with ASD might also suffer from a dominance of the right hemisphere [8,50] described the theory of caetextia. For these authors, the theory of central coherence and the theory of mind are limited explanations of the cognitive functioning of individuals with ASD. These authors have brought to light the left brain/right brain caetextia distinction with respect to their numerous clinical and psychotherapeutic experiments in the field of autism. This valuable distinction then brought to light the singularity of right-brain adults with ASD. Certainly, for left-brain adults with ASD, the diagnostic criteria are evident (lack of reciprocity, rituals, inflexibility toward newness and unexpected events) but for right-brain adults with ASD, there are numerous possible confusions between psychotic or borderline personalities, coming from their distrust, their feeling of being threatened, their explosivity, their impulsivity and their emotional liability. Indeed, right-brain adults with ASD may cry easily when angry, for example. Having looked further at right-brain caetextia, we find all the characteristic symptoms of autism, such as: anxiety, rituals, restrained interests, incapacity to put oneself in another's place, dichotomous thinking, sleep disorders, slow comprehension, difficulties adapting to newness and unexpected events. Griffin and Tyrrel [8] explain the occurrence of these symptoms through a deficit in parallel processing of information. For them, adults with ASD offset this deficit by a dominant usage of one of the hemispheres in order to reconsider experienced events by trying to consider different points of view, something which forces them to treat lived experience in distinct and successive phases. Which is why adults with ASD have difficulties with changes and newness. Thus they choose to live in familiar environments and those in which what is expected of them is defined. In this way they can become sufficiently competent and confident in their role, to an extent that their caetextia is no longer noticeable.

Case Study From Two Adults With ASD (For Didactical Purposes)

In 2011, we encountered two young women with ASD, "Dextra and Sinistra"; their therapy is currently ongoing. These two first names are taken from the theory of the hemispheric dominance of caetextia suggested in this article. Dextra refers to right-hemisphere dominance and Sinistra to left-hemisphere dominance.

Dextra is a calm young woman with a relaxed appearance. Her body is hypotonic but her hands are sweaty. She avoids looking in anyone's eyes; she often looks at her shoes.

Sinistra is nervous: jumpy at the slightest noise, attentive to all details, disturbed by the brightness of neon lights. When she moves about, her movements are "robot-like", there is no shifting of her body, she moves as if her body was frozen. She does not look away from meeting other people's gazes, but stares directly and becomes focused on points that are not pertinent during an interaction.

Both patients suffer, in varying degrees, of a hypersensitivity with respect to sensory systems and especially somesthetic ones (exteroception, proprioception and interoception). Dextra's hypersensitivity appears to be less than Sinistra's. Sinistra explained to us that she watches television with sunglasses because she is so disturbed by the light rays, and that she avoids wearing underwear as much as possible (often does not wear any) as well as avoids certain food textures. Their autonomic nervous systems appear to be always on alert. For both women, any event, even insignificant ones are treated as very important, and they both are aware of this.

During our interviews, the absence of reciprocity is blatantly obvious. Both women demonstrated their incapacity to put themselves in another person's place, to interact in an appropriate manner. This is not a problem for them, but they do not understand why. However, the issue behind each woman's functioning is radically different as it is related to their hemispheric dominance in information processing. On the one hand, Dextra tends to lose her way when reasoning, to make random associations between different situations she recounts, while Sinistra has a singularly-focused, linear and rational vision of her experiences; in both cases there is an incapacity to extract main points and appropriate information. Both women shared their experiences with us: "*when I was a child, I learned to conform to what was expected of me. I managed to do this for authority figures like my parents or my teachers, I never understood what my peers expected from me. I tried to integrate, sometimes I was able to but when I failed I never understood why. I tried to do as others did, but I lacked authenticity.*"

For Dextra, information comes in an abrupt manner, without any meaning, she is the one who must find a logic—a "logical" construction undertaken by the right hemisphere—something which generates an enormous amount of thinking and anxiety; a large amount of information is added and processed for several days, subjecting her to unrealistic expectations with respect to her capacities. Here is an example she recounted: "*I must absolutely find the reason why he said hello on the doorstep, is there a hidden meaning, did he do this on purpose?"* On top of this, she must confront her difficulties with maintaining her concentration and her attention throughout the length of her thought process. Her distractibility further complicates her process of integrating information and increases her emotional lability. Dextra tells us that: "*my thinking stops and starts and I become exhausted. During the night, my dreams are filled with information that I am busy processing and so when I wake up, I'm confused, I can no longer tell what is coming from the dream and what really happened*". For Sinistra, information is assimilated and structured slowly and in a linear and logical way; she has no problems with concentration but needs a lot of hours of sleep to recuperate. She overlooks a lot of information. As she says: "*I don't have enough time to generate coherence between all the information*".

For Dextra, there is too much information to process; for Sinistra there are too many holes to fill in.

Sinistra explains: "*It took mammals millions of years to develop and while mammals learn to store memories of previous encounters in order to use them again over the next million years, humans have to do this in 14 years of mandatory schooling*".

In both cases, one of the resources for re-assembling information is to try to structure them, to apply rules learned through previous experiences. Here are two examples they gave: *"when you must ask something at a shop, you shouldn't ask too many questions because the other customers will be angry at having to wait; you should look a police officer in the eyes otherwise he will think you've done something wrong or that you don't respect his authority"* and added to this are thought development rituals (use of Bayesian framework cited above in Section 2.5). These are thus conditioned responses [9].

One of the main consequences of the incapacity to manage attention flows in parallel is not being able to understand and control one's emotions. For both women, they must handle constant stress (daily work, interpersonal relationships), surprise at the slightest unexpected event as well as a flow of information to process and integrate into its context. This is similar to what Sinistra describes as: *"putting a city person (who has never been to the mountains) in front of a mountain with three other people and tell him that he is the leader and he must get up to 4000 meters with these three"*. Throughout her entire life, Sinistra was confronted with constant criticism from her entourage, stemming from the fact that she never learns from her errors because there is always too much information to process and sort through. She does not see similarities between learning situations and therefore does not learn from her mistakes - "*I am the problem*". As for Dextra, she often feels flustered and under great stress when faced with many events that suddenly come up, and for which she looks for rules, sometimes absurd - "*everyone else is the problem*". For Sinistra, when several people are speaking she does not follow the general idea, everything goes too fast; she has decided to laugh about it (because she's the problem) and does not attempt to plan ahead and to understand, at the risk of no longer daring to meet people. While for Dextra, she analyzes after the fact all the information received from each person and tries to put meaning to it, something which makes her distrust other people's intentions (because the others are the problem). She feels confused and overwhelmed, out of control, which makes her reactions lie between extreme anxiety and anger. For Dextra, her thinking and behavior are bizarre, because she engages in typical right-brain rituals (for example, keeping track of the exact time that something happened, of the position of individuals between themselves, of the precision of words used, etc.) Sinistra has behaviors and makes remarks that are childish and overly polite, like raising her hand for a turn to speak or offering very clear-cut opinions on what is good or bad. Sinistra asks us: *"Do I need to know how to use emotions and affectivity and feelings in work and in daily life? Does speaking with people who use irony with me - and which I don't recognize - rely on affective, emotional and sentimental ideas? This happened to me in the garden - luckily a neighbor and her son who were there told me that the woman I was speaking with had spent her time making fun of me and I hadn't understood! Are affectivity, emotions and feelings important parts of one's identity? Is identity created through a diagnosis of ASD?"*

Dextra is highly emotional and reactive; if you give her a criticism, she thinks you wish her harm; if you give her a compliment, she also thinks you wish her harm, because she isn't able to understand another person's intentions other people are perceived with circumspection. Sinistra is much too rational. She does not display any frank facial and emotional expressions. Dextra is terribly afraid of becoming dependent and at the will of other people's thoughts, she is afraid of being "had". Sinistra cannot imagine that another person might want to harm her, or hide their intentions; other people are seen as good. Sinistra waits for a person to give her bearings, she imitates others.

For Dextra: "*My right brain takes over, I get lost in a maze of options, like a tree, I can no longer distinguish the trunk from the spread of the branches. Everything is exhausting, I am not able to take account of all the information and I look endlessly for commonalities, in vain. My left brain works only locally, when I'm on a branch*"

For Sinistra: "*I have the impression that my right brain is there, but works independently. If I have a unified brain, the left side would be like a multinational company (with accumulated years and information working all the time under ISO standards - of course for the sake of conformity) and my right brain, which would be an artisan, the neighborhood unifier, working under the orders given only be a few faithful customers.*"

We present here below a table meant to explain how left and right dominances offer different attractors in order to become aware of similar problems. These attractors offer forms which are particular to their adaptive strategies, and which for professionals constitute symptoms.

The elements thus mentioned re-launch the debate on the problem: continuum vs. categories.

When patients implement these adaptive strategies, it is their way of giving reality to a muddle that presses down on them. For them, the solution must inevitably be unique (Table 1).

Specific Therapeutic Program Tailored To Left-Brain Or Right-Brain Caetextia

Left-brain or right-brain caetextia demonstrates an underlying condition of functioning in an individual with ASD. By looking at autism in this way, we understand that an adult with ASD expects his therapist to be able to understand his cognitive capacities and to help him do what neurotypical individuals can do instinctively. The therapist must be able to explain and teach him new behavioral rules. A certain number of guides and practices already exist for supporting autistic individuals [53-55].

Different attractors for alternative therapies		
Fields	**Strategies of Sinistra**	**Strategies of Dextra**
Neuro-biology	Left-hemisphere dominance over mental activities and behavior	Right-hemisphere dominance over mental activities and behavior
Body	Hypertonic body, nervousness, fixed stare	Hypotonic body, sweaty hands, does not look anyone in the eye
	Exacerbated sensory hypersensitivity	Slight sensory hypersensitivity
	Need for many hours of sleep	Difficulty sleeping (insomnia, difficulty falling asleep, frequently wakes up)
	Constant state of stress	Constant state of stress
Cognition	Linear and rational analytical vision of experiences	Tends to get lost in abundant reasoning Thinking supported by random associations
	Too many unknowns to fill in	Too much information to process
	Information gathered and structured slowly and in a linear and logical way No problems with concentration	Information processing does not provide coherence Concentration problems, easily distracted
Emotion	Difficulty perceiving emotions	High emotional lability with explosivity
Behavior	Never learns from mistakes. “I am the problem.” Trusts others	No similarities between events. “Other people are the problem.” Distrusts others
Conse-quences	Childlike behaviors and comments	Bizarre and psychotic-type behaviors

Table 1: Describes how the left (Sinistra) and right (Dextra) dominance types offer different attractors to understand/grasp the various areas affected.

Relaxation

With our own clinical inferences, we know that breathing techniques to reduce anxiety really help people with autism. For those who are vulnerable to extremely angry explosions, it is important to work on identifying the anger and teaching them simple alternatives to avoid these explosions. We also know that relaxation works to reduce stereotypical behaviors and rituals. It also works to better manage unexpected situations and to help keep control.

Work on emotions

Many adults with ASD like Dextra are distrustful, something which compromises their skills at connecting to the so-called "ordinary" world. These patients have strong imaginations as well as a strong emotional lability and this is not moderated by the left brain. They spend a lot of time disconnected from reality. All of the therapeutic work at the beginning consists of channeling their emotions. By doing this, we develop their ability to read emotional context, to keep track of their own emotions in their decision making. We organize their sensory integration.

As for adults with ASD like Sinistra, they have trouble feeling and recognizing their emotions. Work on recognition techniques for her own emotions is thus necessary so that Sinistra becomes aware of them. In contrast to Dextra, for whom the goal is to stabilize her explositivity, for Sinistra the work focuses on decreasing anhedonia. This work is more complex compared to other psychological difficulties because it is difficult, even impossible, to work within the imagination or with self-observation. It involves working in sessions on a reconstruction of a lived experience and for which Sinistra can feel and thus reconstruct the emotion that was present at that time. In this case, the therapist works a lot in Sinistra's place, making functional analyses of the Cungi vicious circle type [56]. For Sinistra, becoming aware of emotions is vital. She has a rudimentary, overly linear system of interpretation. By adding an awareness of emotions, her interpretive model of experience becomes more complex. A person who is aware of his own emotions can say that other people are also endowed with emotion. In both cases, we work with both the physiological manifestations and physical symptoms linked to emotions. The symptoms are detailed every day, not by self-observation (rating emotions from 0=absence of emotion to 10=strong emotion is too difficult because abstract) but using a scale such as the "symptoms of anxiety inventory" by Cungy. By doing this, we help them put diverse elements coming from a single event into parallel, and in this case, to link the lived experience to the emotion and to the felt symptom.

Cognitive model and coping strategies

Once an emotional control is established, the therapy for Dextra involves restraining, even inhibiting, her overly broad associativity by putting rational hypotheses into her lived experiences. The therapist must look for arguments that can be used again and again. For example: my boss greeted me on the doorstep. Why did he do it right then, is there a reason? The therapist adds some logic. Does the place where a greeting takes place play a role in the interaction? The answer is no. The rule is: "*what is important is the fact the boss gave a greeting. This is a friendly sign, a sign of good will.*" In this way, the therapist's questioning and reasoning about this event could be used by Dextra in other situations like being greeted by a shop person or a stranger. It is important to use a similar formulation as much as possible for each situation dealt with so that Dextra can become familiar with the approach and the rules. For situations that Dextra deals with, the therapist must find, whenever possible, neutral and positive arguments in order to balance out her spontaneous distrust.

For Sinistra, the therapist's work consists entirely of enriching her rational thought; to always give her more alternatives. The same principal of familiarity is used with Dextra in order to provide her with an apprenticeship and a suitable adaptation. With Sinistra, the

therapist brings complexity into her logic. He shows Sinistra how her mode of communication may affect other people's emotions. Example of a situation for Sinistra: one day a friend is meant to eat with Sinistra but the same day the friend has an accident and finds herself in the hospital. When the friend calls to say what has happened, Sinistra says: "*but what am I going to do for supper?*" The therapist will recognize and validate that Sinistra's question is legitimate and logical. But he will also push Sinistra to become aware of the friend's priority at that time by highlighting that the friend is more preoccupied with her accident than with Sinistra's supper. In order to highlight this new priority, the therapist will suggest the following alternative: Sinistra will ask her friend if she can do something for her. This rational alternative - do something for another - is preferred to an overly abstract alternative like "is everything okay" because Sinistra would have the tendency to respond: "*if she called me it means she's okay, why would I ask her how she's doing?*" In this case, the therapist needs to offer an alternative that could conform to Sinistra's manner of logical thinking. This alternative can be generalized to other situations like: someone tells her that he's been fired, an acquaintance mentions a divorce or the death of a family member or friend. The alternative of saying, "can I do something for you" enables Sinistra to adjust her behavior into something more appropriate compared to her usually overly rational and unempathetic behavior. In Sinistra's world, she must be made aware and integrate the fact that the emotional dimension is one of the influencing factors of neurotypical social interaction [57].

Availability

Through our therapeutic experiences, we really recognized the importance of our flexibility and the necessity of adapting to the particularities of ASD. The developmental of the therapeutic alliance is based on a collaborative relationship that is an important factor for therapeutic effectiveness and both patient and therapist satisfaction. This relationship can be seen when both the patient and the therapist work together to resolve problems. Alongside his professional skills (empathy, warmth and authenticity), the therapist, within the framework of supporting an adult with ASD, must demonstrate a broad availability throughout the therapeutic process. This involves a functional evaluation within the framework of an integrated bio-psycho-social support program. Example of a modification of this approach: additional therapy through intense email exchanges. The goal of this additional therapy is to decrease the individual's anxiety, improve understanding and therapeutic relationship as well as optimize effectiveness in terms of reaching therapy goals.

Conclusion

Through this article, we suggest an understanding of the deficits related to ASD as alterations of the parallel processing needed to integrate sensory data into executive functioning. Since parallel processing also ensures cooperation between the different processing contributions made by the two hemispheres, what happens is a larger functional dominance, either right-brain or left-brain, in these patients. As a result, we see a marked diversity - qualitative and quantitative - in terms of ASD's manifestations depending on a given individual's lateralization. This diversity lies at the heart of the difficulty in detection, diagnosis (autism or borderline patients, for example) and therapeutic support offer for these patients. We would also like to underline the necessity of adapting therapeutic methods and content as closely as possibly to what a patient actually experiences, so to avoid creating a standardization that would be incompatible with our desired effectiveness.

Caetextia is a major handicap within autism spectrum disorders because it often remains undetected even today. Essentially, when an adult with ASD becomes familiar with his environment and what is expected of him, he can become sufficiently competent and confident so that this blindness is hidden. This is how certain adults with ASD remain undiagnosed and end up looking for help because of emotional difficulties (anxiety, anger, depression) linked to particular contexts such as new romantic relationships, inability to keep a job, money management, unsatisfied sexual needs. In these particular contexts, it seems that caetextia exacerbates their inability to confront their environment in a suitable way.

The greatest challenge for the therapist is to know how to distinguish and recognize a person living with a "left brain or right brain caetextia" type of ASD's. Indeed, after our experience and those of certain authors, we have found that left-brain adults with ASD are harder to detect and also the ones for which it is most difficult to create and maintain a therapeutic alliance. There is a lot of confusion in diagnostic criteria because certain symptoms described for ASD's are masked or not clear. More than that, a professional can interpret the signs of right-brain caetextia (distrust, explosivity, impulsivity, emotional liability) as symptoms of a borderline or psychotic personality disorder. Unfortunately, in our practice, several right-brain adults with ASD experienced just this and their therapeutic support program was not adequate. The therapeutic alliance is fragile because of Dextra's dichotomous thinking. Either the therapist is with her, or against her. As for left-brain adults with ASD, their intellectual capacities mask their syndrome and the therapist tends to turn toward a diagnosis of depression [58], general anxiety disorders, phobias or obsessive-compulsive disorders. With these patients, the therapeutic alliance is good because they help their therapist a lot.

Finally, it is also important to make the difference between a case of PTSD which can bring about some autistic adaptive and ASD's behaviors. Here again the professional can generally make a distinction, not by looking at the symptoms which can be relatively similar, but through the theory of caetextia because individuals suffering from PTSD do not have caetextia.

In conclusion, the article may give the impression of splitting the adult with ASD's diversity in two rather stereotyped categories but we have lead the readers to this kind of structured and two-sided understanding for didactical purposes. Knowing which type of caetextia we are dealing with enables the therapist to abandon—or at least to use with great caution—the techniques of self-observation and introspection and thus avoid failure [59].

Table 1 describes how the left (Sinistra) and right (Dextra) dominance types offer different attractors to understand/grasp the various areas affected

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