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METACOGNITIVE INTERVENTION WITH A PERSON WITH ATTENTION DEFICIT HYPERACTIVITY DISORDER (ADHD)

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ABSTRACT

Attention Deficit/Hyperactivity Disorder (ADHD) is a neurodevelopmental, childhood-onset, and self-control disorder. It is characterised by marked and persistent levels of inattention, impulsivity and hyperactivity, which are disproportionate to age. For a long time, it was believed that ADHD was a disorder exclusively characterising childhood/adolescence. Still, scientific evidence has shown that it persists throughout life in up to 85% of cases, causing significant difficulties even in adulthood.

This paper presents a metacognitive intervention for an eight-year-old child in the third grade of primary school.

KEYWORDS: Attention Deficit Hyperactivity Disorder (ADHD), Metacognition, Self-control, Verbal self-instruction.

INTRODUCTION

Attention *Deficit/Hyperactivity Disorder (ADHD)* is a neurodevelopmental, childhood-onset, and self-control disorder. It is characterised by marked and persistent levels of inattention, impulsivity and hyperactivity, which are disproportionate to age. For a long time, it was believed that ADHD was a disorder exclusively characterising childhood/ adolescence. Still, scientific evidence has shown that it persists throughout life in up to 85% of cases (Barkley, 1997), causing significant difficulties even in adulthood (Courtenay, 2025).

ADHD is one of the most frequent and most studied disorders; it affects 3-5% of school-age children with a normal or above-average IQ and is much more frequent in males than in females, with a ratio of 3:1; furthermore, a certain familiarity has been observed in first-degree relatives.

It is estimated that approximately 7% of the child population and 4% of the adult population are affected. However, although the disorder is now known to occur in adults, only a fraction is diagnosed and treated. The disorder is usually first diagnosed during primary school, when school adaptation is impaired. However, most parents observe excessive motor activity when children take their first steps. The disorder is relatively stable during early adolescence and subsides during late adolescence and

adulthood, although a minority maintain symptoms during adolescence and adulthood (Popit, Serod, Locatelli & Stuhec, 2024).

Children with ADHD exhibit such impulsivity and activity levels that they cannot sit still, appear constantly agitated, talk when they should listen, interrupt speech, fail to complete a task, appear not to listen when spoken to, and continuously lose objects due to their inattention. They sometimes risk hurting themselves because of their impulsiveness, are unable to sit for long periods in class, and their inattention can cause learning difficulties. They are emotionally labile, hardly able to self-regulate their emotions. Even once they become adults, they continue to have problems. They struggle to hold down a job, they often cause traffic accidents, and during conversations, they stimulate irritation in others because of their difficulty in waiting for their turn and their tendency to speak at inappropriate times.

In short, these are children with high levels of activity, who move around too much, cannot sit still, are restless and reckless, talk incessantly and are too curious. These behaviours, typical of hyperactivity, follow certain stages in development that can be schematised as follows:

1. *Difficult character* (0-14 months). The child has sleep or feeding problems, is over-emotional, hyperactive and is often described by parents as 'nervous'. In some cases, there may be a delay (later recovered) in the acquisition of elementary behaviours characteristic of early childhood (e.g. head control);
2. *Excessive exploratory activity* (14 months to 3 years). Exploratory behaviour is greatly exaggerated.
3. *Turbulent behaviour* (Kindergarten). In kindergarten, the first difficulties appear in devoting oneself to a task and completing it, taking one's turn, and so on.
4. *Hyperactivity* (Primary School). One can speak of true Hyperactivity with 'primary' schooling. The child is faced with the demand to respect specific, precise rules given to him from outside. The child generally encounters two severe difficulties: a) difficulty concentrating in school activities, and b) adult punitive responses.
5. *Pre-adolescence*. The hyperactive child's poor performance in school activities causes him/her frustration and low self-esteem.
6. *Adolescence*. The hyperactive child can become a high-risk adult or a very dynamic and active adult, depending on how the hyperactivity was channelled in the early years of life.

To try to delineate better the role of 'attention' and 'hyperactivity' and their 'overlapping' (comorbidity) in ADHD, we can refer to the DSM-V (APA, 2013), in which the following diagnostic criteria are the main ones: 1) presence of at least six symptoms for a minimum of six months and in at

least two contexts; 2) onset of symptoms before the age of seven; 3) clear evidence of impairment in school, social and general functioning as a result of the non-adaptive behaviour (Musullulu, 2025).

If a subject exclusively presents 6 of the nine symptoms of inattention, the diagnosis is ADHD, inattentive subtype; if the subject exclusively presents 6 of the nine symptoms of hyperactivity-impulsivity, the diagnosis is ADHD, hyperactive-impulsive subtype; finally, if the subject presents both problems, the diagnosis is ADHD, combined subtype.

The symptoms presented in the DSM-5 are the same as those contained in the ICD-10 (WHO, 1992), the only difference being found in item (f) of the hyperactivity-impulsivity category (talking excessively), which, according to the WHO, is a manifestation of impulsivity and not hyperactivity.

This systematisation has undoubtedly made it possible to achieve a greater degree of clarity and greater uniformity of assessment in diagnosing ADHD. Still, numerous doubts and perplexities remain as to the validity of this diagnosis. It is still unclear whether the inattentive subtype is really a manifestation of ADHD, or whether, instead, it represents a different disorder, or whether it is the consequence of psychological distress deriving from heterogeneous causes. Secondly, research has not yet shown whether the hyperactive-impulsive subtype is separable from the combined subtype or whether it represents an early stage of development of the same disorder that, concomitant with entry into primary school, takes on the guise of the combined subtype (Barkley, 1997; Bislacchi & Fabbro, 2002).

Thus, what is lacking in these children is the control of rules over behaviour: the most significant difficulties emerge when specific instructions require, on the part of the subject, a delayed, constant and accurate response or during activities in which reinforcement is given sporadically or is absent.

Although diagnostic criteria allow ADHD to be described more accurately, the aetiology of the disorder, as is often the case in developmental psychopathology, is still very uncertain.

1. Aetiological interpretations

Aetiological research has taken various directions, now orienting itself in the biological and neuropsychological spheres and focusing on identifying the psychological factors involved in the onset of symptomatology.

1.1 Biomedical theories

In recent years, various studies conducted on twins have established that the heritability of ADHD is approximately 1'80% (Cook, Stein, Krasowski, Cox, Olkon, Kieffer & Leventhal, 1995; Swanson, Sergeant, Taylor, Sonuga-Barke, Cantwell, 1998). These studies identified two dopamine-related genes that are altered in ADHD cases: the first (DAT1) would be linked to dopamine transport, and the second (DRD4) would act on its receptor. These results suggest that the attentional disorder that defines the syndrome may be due to damage in the neural networks comprising regions rich in dopaminergic

receptors: either too little sensitivity to dopamine or too much efficiency of one of its transporters, resulting in a decrease in the activity of brain regions involved in attention.

Other authors (Grodzinsky & Diamond, 1992; Rubia, Overmeyer, Taylor, Brammer, Williams, Simmons & Bullmore, 1999; Castellanos, Giedd, Eckburg, Marsh, Vaituzis, Kaysen, Hamburger & Rapoport, 1994) using the technique of functional magnetic resonance imaging (FMR) have demonstrated: 1) a reduced frontal activation in adolescents with ADHD during the performance of specific tasks involving executive functions and 2) the absence of the normal asymmetry of the Caudate Nucleus whose size of the right portion was reduced in ADHD subjects compared to subjects in the control group. Ernst, Zametkin, Matochik, Pascualvaca, Jons & Cohen (1999), using Positron Emission Tomography (PET), found abnormally low extracellular dopamine levels in ADHD children, and this, according to them, could be the primary problem in the disorder (Bisiacchi & Fabbro, 2002).

Based on these neurophysiological data, Barkley (1997) and Sergeant (2000) proposed theoretical models to explain the behavioural deficits of ADHD.

In his model, Berkeley stated that the leading cause of the disorder is a deficit mainly involving the ability to inhibit behaviour, and attentional deficits would be correlated with this primary disorder. According to this model, the primary deficit of behaviour inhibition includes: 1) inability to inhibit insistent responses; 2) inability to interrupt an ongoing response; 3) inability to control interfering stimuli. At the same time, secondary impairment reduces the ability to: 1) non-verbal working memory; 2) verbal working memory; 3) self-regulation of affect/activation/motivation; 4) reconstitution (analysis and syntax of behaviour). The primary purpose of this model is to propose an empirically verifiable interpretation of ADHD and to specify better the cognitive and behavioural components described in DSM-5.

Sergeant's cognitive-energetic model provides for three levels of analysis of the disorder. On the first level, a group of cognitive processes are provided: encoding, central processing and response organisation. The second level of the model consists of three energy groupings: arousal (short-lasting, physical response to an endogenous or exogenous trigger), activation (generalised increase in physiological activity in preparation for an action and is prolonged in time) and exertion (the energy required to complete the task and is influenced by variables such as the information load to be processed by the cognitive system). The third level of the model contains an organisational system or executive functions for processing and evaluating information. This level is associated with monitoring, error detection and correction, and behavioural control. For some authors, it is precisely at this level that the specific disorder ADHD is to be found.

1.2 Psychological theories

Many behavioural observations of children with ADHD have reported their tendency to distractibility, which has often been explained as a disorder of selective attention or sustained attention. But according to Prior (1991) these subjects do not seem to be particularly distracted by incidental information to the detriment of learning the central one and, at the same time, there is insufficient evidence to affirm the presence of problems in sustained attention, or in any case that these cannot be considered of an absolute nature since, at the basis of them, it is necessary to consider both the probable lack of self-creation and self-control and the decisive role that the various forms of external control come to assume. Some data by Douglas and Peters (1979) lead to the conclusion that there is not, contrary to what one might think, a deficit in focal attention: in a study in which the ability to solve specific problems in a distracting environment was measured, the children with ADHD performed as well as the control group. The distractibility characteristic typical of these subjects would instead be attributable to their marked tendency to seek out new stimuli, which would act in conjunction with a deficit of 'divided' attention, i.e., the ability to pay attention to several things simultaneously. Added to this would be a specific deficit of sustained attention over time, which would also be related to factors of task orientation, the ability to inhibit impulsive responses and motivation. The difficulties inherent in the motivational aspect of self-regulation are not limited to the specific factors of interest and maintenance of attention on a task, but involve other abilities such as the realistic assessment of the solvability of a task, the decision to invest time and effort in a solution process anticipating a positive outcome, the ability to self-reinforce commitment, and the maintenance of a proper level of emotionality.

Douglas (1984) proposed an explanatory model that identifies four basic tendencies characteristic of ADHD children: 1) marked tendency to seek immediate gratification and stimulation, 2) reduced investment of attention and effort in complex tasks, 3) considerable difficulty in inhibiting impulsive responses and 4) difficulty in modulating the level of arousal in the face of situational demands.

These tendencies would act in close interaction with secondary deficits such as slowed development of complex action patterns such as skills and strategies, low intrinsic motivation to perform tasks, poor metacognition both in terms of knowledge and control of applied procedures. A circular relationship would thus be established between the child's basic characteristics, his experiences of failure, the tendency to avoid complex tasks and secondary deficits, which would tend to reinforce the inattention and impulsiveness typical of ADHD subjects (Douglas, 1984).

In these subjects, therefore, the essential attributes typical of an information processor appear to be lacking: inadequate integration between the aspects of behavioural self-regulation and motivation, failure or partial development of connections of a positive result obtained by applying a strategy, the intention to inhibit or defer a response; the formation of a plan of sequences of actions; mental representation of the task, etc. (Douglas, 1984). The presence in ADHD of these symptoms that are also found in frontal syndrome (Shallice, 1994; Pennington, Groisser & Welsh, 1993) has given rise to a theoretical and clinical point of view that considers hyperactivity as a dysfunction of the frontal

cognitive system; consequently, attentional disorders, as well as problems in impulse control and failure to inhibit responses to salient stimuli could be the consequence of a more general integration difficulty. Grodzinsky and Diamond (1992), in their methodologically accurate study, found that hyperactive children were poorer on both tests related to inhibition/impulsivity and those requiring the ability to plan and organise, thus confirming the ‘frontal’ hypothesis in hyperactivity (Guazzo & Ginolfi, 2025).

However, given the slow and gradual development of the frontal cortex and thus of the various cognitive processes that relate to it, it is not easy to understand whether the difficulties of hyperactivity are due to a maturational delay or a permanent deficit. Unfortunately, providing a definite answer in any direction is impossible, as longitudinal research studying the same subjects over an extended period is required. Studies on the parallelism between ADHD and ‘frontal syndrome’ have had the merit of shifting the focus from an inhibitory or attentional deficit to more complex integrative processes (Bisiacchi & Fabbro, 2002).

These studies have, however, highlighted how in this disorder, in addition to the classic symptoms (inattention, hyperactivity and impulsiveness), poor frustration tolerance, insecurity, low self-esteem, anxiety, phobias, flight and avoidance responses, emotional immaturity, isolation, etc. are often present. More specifically, the frequent comorbidity of ADHD with Mood Disorders, Anxiety Disorders, Evacuation Disorders, Disruptive Behaviour Disorders, Communication Disorders and Learning Disorders has been highlighted.

Various researchers (Sandberg, 1996; Vio, Offredi & Marzocchi, 1999; Javorsky, 1996; Pennington, Groisser, Welsh, 1993) have shown much interest in the comorbidity between ADHD and Specific Learning Disorders (SAD): the two individual disorders represent two distinct clinical disorders and that different cognitive domains underlie them; the problems in the acquisition of reading, for example, in children also diagnosed as ADHD, were due to primary neurolinguistic dysfunctionalities specific to that SAD. In other words, even if it cannot be ruled out that ADHD and DSA may be present simultaneously in the same subject, the need to consider the presence of primary and secondary symptoms is becoming increasingly evident: in the DADHD subject, the negative learning outcome is triggered by attentional difficulties that, in turn, contribute to hindering the implementation of helpful cognitive strategies and the effective regulation of mental processes. Hence, the need to immediately choose the most appropriate treatment for the ADHD disorder and not primarily for DSA (Guazzo, Buono, 1992a).

2. METHODOLOGY

Despite the growing interest at the clinical level in this disorder, there is still no truly effective treatment. In Anglo-Saxon countries, pharmacological treatment with psychostimulants (above all Methylphenidate and Moclobemide) is massively used, which would allow a reduction in hyperactivity, an improvement in sustained attention, problem-solving and comprehension of written

text (Ritchers, Arnold, Jensen & Abikoff, 1995; Zuddas, Cavolina, Pisano & Ancilletta, 2001; Tortorella, Martiadis & Fiorillo (2003)).

The intervention must be customised, prolonged over time, with diversified and integrated interventions: a fundamental aspect is the involvement of both parents and the collaboration of all the educational agencies that revolve around the child. Lambruschi and Ciotti (1995), in a research they highlighted that ADHD can be the resulting disorder of two different developmental paths in a resilient-coercive pathway, where hyperactivity and distractibility are used as a form of control, to constantly keep an unpredictable and fluctuating parent in care, and in an avoidant pathway, where hyperactivity and inattention are used to compensate for the absence of the parent, to a work with the family also a cognitive-behavioural treatment, such as those currently proposed.

Participant

Marco is an 8-year-old child in the third grade of primary school who cannot give sustained attention (concentrate) sufficiently long to carry out a task, even to his liking. Despite being monitored very closely, he constantly gets up and sits down, disturbing the class. Marco was assessed not only with the DSM-5 but also with the Conners 3 (2008) (extended version for teachers) (Musullulu, 2025).

These assessments show that the child had low concentration levels, had difficulty staying focused on the task, and could not inhibit distracting stimuli. Furthermore, he reacted to external stimuli (cognitive, behavioural, etc.) with immediate actions without adequate reflection on the consequences. But the aspect that worried parents and teachers the most was the difficulties in managing Marco's emotional reactions, who presented frequent manifestations of both physical and verbal aggression with others (adults and/or peers). Given this, the intervention programme taught metacognitive strategies to foster self-control.

1. to reduce the level of arousal that was often exceptionally heightened due to a stimulating event, such as even a mild insult that triggered angry reactions
2. identifying a plan of action that enabled the subject to interact correctly with the peer who had insulted him, without giving in to anger (problem solving);
3. continuously observe the behaviour, recording one's reactions.

Intervention

Before starting the intervention on the child, a training course for the parents (Parent Training) was initiated. The need to deal systematically with the parents stems from the fact that the presence of a child with ADHD has serious repercussions on the whole family, bringing significant changes to the lifestyles and quality of life of its members. There are clear and indisputable indicators of this, both 'objective' and 'subjective'.

The 'objective' ones can be found in the reduction of extra-familial activities (work, social relations with neighbours, free time, etc.), while the 'subjective' ones are in the increase in stress levels, the

decrease in marital satisfaction and psychological well-being, since such presence requires care and attention. If, until not so many years ago, parents and family members were excluded from educational programmes and interventions and relegated to mere observers of what others (specialists) were activating, today, an important function is recognised, even regarding the efficacy of treatments.

Parents, in fact, address requests to specialists and services on how to treat and manage their children's inadequate behaviour, how to reduce its frequency, intensity and duration, how to increase their abilities in the different areas of development and learning, and 'what' they can do to cooperate adequately. Involving parents in treatment has the following undeniable advantages (a) parents, being in contact with their children longer than any other person, can intervene throughout the day, (b) their involvement facilitates the generalisation of any skills that the child may have acquired, (c) training programmes aimed at parents and aimed at transferring educational skills in a broad sense enable them to deal with and probably solve any new problems that may emerge in the future, and d) parents who previously felt excluded from the educational relationship, feel at the end of the training period, responsible elements in fostering the correct cognitive and social development of their child (Claussen, Holbrook, Hutchins et al., 2024).

Following the parents' involvement in Marco's ADHD treatment, a metacognition intervention was implemented. The latter term indicates the subject's knowledge of his cognitive activities and the control he can exercise over them. In other words, metacognition refers to all those cases in which the subject, relying on his or her knowledge, can organise a given task with the aims to be pursued in mind, can anticipate the quality of his or her performance, is aware of what he or she is doing and the associated probability of success (Flavell, 1985). This strategy comprises two distinct factors: the subject's awareness of his or her thinking activity and cognitive ability to regulate and influence this activity, by devising and choosing problem-solving strategies and evaluating their effectiveness.

The metacognitive aspects (knowledge, evaluations, and decisions that lead the subject to carry out the process in one way rather than another) are involved in any cognitive activity, at least on the surface. They are mechanisms that only occur during the execution of mental processes. In reality, these mechanisms, called *metacognitive control processes* (which preside over cognitive processes during their execution) are possible only because the subject already possesses knowledge about the proposed task that enables him to understand it and deal with it appropriately; this latter process is called *metacognitive knowledge* (knowledge that an individual possesses concerning the functioning of the mind) and plays a causal role in cognitive activity (Mazzoni & Cornoldi, 1991; Mazzoni, 1995).

All metacognitive programmes, in their operational implementation, refer to three different levels (Ashman, Conway, 1989): 1) knowledge of cognitive functioning in general, 2) self-awareness of one's cognitive functioning and 3) generalised use of cognitive self-regulation strategies. Verbal Self-Instruction was chosen as an intervention technique to meet these three levels of the metacognitive programme based on Marco's functioning profile.

This technique aims at developing, in a first step, the subject's self-awareness of the dependence of his behaviour on the evaluations and instructions he gives himself; and, in a second step, the modification, using appropriate training, of these evaluations and instructions leading, finally, to the modification of the undesired behaviour(s) (Meichenbaum, 1974). Self-instruction stimulates subjects to use their inner language (manifestly), in simple sensorimotor (later cognitive) tasks, through phases in which they learn to monitor their behaviour to issue 'covert' self-instructions relevant to the task at hand (Meichenbaum, 1975).

In some categories of behavioural problems, a specific deficit in the ability to self-regulate through language has been hypothesised. One example is the 'mediational deficits' of impulsive children like Marco. The term mediational refers to a behavioural response pattern characterised by an extremely short latency between stimulus presentation and response, thus producing poor school results, conduct problems, aggression, etc. In other words, the impulsive child seems not to have learned how to analyse his experiences appropriately and does not know how to formulate internal rules and plans, which can appropriately direct his attention and guide his performance in other learning situations. The implementation of the technique with a marker foresaw the following steps (Meichenbaum & Goodman, 1971):

(a) *Task selection.* Tasks were selected that required prolonged concentration and the application of a strategy for their correct execution. The information obtained during the assessment helped the educator choose functions with the appropriate difficulty level for the subject. Initially, however, self-instruction was applied in simple motor tasks (assembling a jigsaw puzzle, copying drawings, etc.), then proceeded to solve more complex problems (school tasks, etc.). To begin with, Marco assembled *a jigsaw puzzle composed of several tiles*, which he liked very much. Still, he was unable to execute perfectly, because he often did not use a strategy and forced the insertion of the tiles, only to tire and throw everything up in the air:

(b) *Cognitive modelling.* The task was performed by an adult who acted as a model by giving self-instructions. That is, he explained the following steps in which a problem-solving strategy is composed:

b.1 Task definition and analysis. *"Let's see, now I must find a tile to assemble the puzzle. The problem is that the tiles all look the same. I could pick one at random, but that would mean guessing. I must find a safe method to choose the initial tile to assemble the remaining tiles"*.

b.2 Identifying the various possible ways of solving the task. *"I can carefully examine each tile and then choose the one on which I recognise the design. Maybe I can select all the ones in the outline. Or I can choose one of the four corner tiles"*.

b.3 Choosing and implementing the strategy. *"If I want to do the task well, I'd better give myself plenty of time and take a good look at all the tiles. I must do it slowly and accurately. I think I will try the*

corner tile method. I take the first top right-hand corner tile, then another from the top left-hand edge of the corner tile. They fit together, and the designs coincide perfectly”.

b.4 Self-monitoring progress towards the solution. “How is it going? I had chosen the strategy of the corner tiles, which works, but I must remember to go slowly and be careful not to try the various tiles randomly. Just a little more and then I'm done”.

b.5 Self-evaluation and self-reinforcement. “I'm doing well. ... Good. Even if I make mistakes, I can fix them and move on. Now I must insert another tile ... That's good. Only five left ... I'm done. I did it!”.

b.6 Choosing an alternative approach in case of failure. “I'm trying very hard, but I keep making mistakes. Maybe I'd better check the strategy used; another method is needed here”.

(c) Explicit external guidance. Marco performs the same task, directed by the model's instructions, thus explicitly helping him to perform the six steps in the problem-solving strategy. “Now you're going to assemble a puzzle and I'm going to tell you how to think, let's pretend I'm you're thinking. ... What am I doing? I must try to find the most suitable tile to start with. What strategy can I adopt? I could pick a tile at random, though, just a moment! I had decided to start with the angular ones and look at the designs properly. Let's begin”.

d) Explicit self-instruction. Marco performs the task by self-instructing aloud. This step is not easy because it requires the child's active participation. In performing this step, one can become aware of how the subject self-administers instructions and note the nature of his self-instructions. The educator should try to initiate the child's self-instruction and then leave him/her to complete his/her own verbalisation.

Educator: “Well, I have chosen the corner card. Now I must...”;

Child: “Check the shape of all the contour tiles”;

Educator: “Let's see, the docking buttons ...”;

Child: “They match. Even the design, ... hum! It's different!”.

e) Modelling of attenuated explicit self-instructions. While performing the task, the educator gives the instructions in a low, ever-lower voice (fading). This phase emphasises the fragmentary and disjointed nature of verbalising the intended thoughts. “Now I'll take another board tile. No. There is a design of this tile that continues the design already reconstructed with the other tiles. No, no, it doesn't go! Phew! Go on, be careful. It's not much further”.

f) Explicit attenuated self-instruction practice. The educator listens carefully to the child and, instead of making him imitate his behaviour, helps him to formulate his thoughts and self-instructions.

g) *Modelling implicit self-instructions*. The educator moves his/her lips slightly during the modelling, assuming a reflexive attitude. Before the modelling, the cognitive elements on which the educator will focus his/her thoughts and self-instructions will be communicated to the child.

h) *Practice in implicit self-instruction*. The child performs the task, mentally repeating the instructions. As implicit self-instructions are used at this level, one cannot control his thoughts directly. However, by observing the child's behaviour and formulating some clarifying questions (e.g. "What *are you thinking about?*", 'Can you explain to me what you did?', etc.), it will be possible to obtain some indications as to how the child deals with the task.

Thus, during thinking aloud the model exhibits several skills relevant to the performance of the task: 1. defining the problem ('I have to assemble this puzzle ...'), 2. focusing attention and guiding the response ('... calmly and accurately ... I take the first corner tile ...'), 3. self-reinforcement ('I'm doing well') and 4. self-evaluation of its performance and correction of errors ("Good. Even if I make mistakes, I can correct them and move on' (Mahoney, 1974).

However, in addition to verbal self-instruction, Marco was also taught several emotion regulation strategies (Guazzo & Nappo, 2025): 1) to reduce, with the help of relaxation, the level of anxiety that often grew disproportionately due to a triggering event (e.g. a 'NO'); 2) to perceive and analyse the problem in all its components to interact correctly with the other person who had responded with a 'NO' to his request; 3) to continuously observe the behaviour by recording his reactions.

The whole teaching programme of metacognition strategies (verbal self-instruction and self-regulation) was carried out in two-hour sessions (alternating moments of intervention: 15-20 minutes and breaks of 5-10 minutes), five days a week, over three months. Verbal self-instruction had to be mastered in cognitive applications such as drawing, colouring and assembling puzzles to control impulsivity before being used in interpersonal situations in school life.

At the end of the intervention, which lasted about six months with follow-ups, the new administration of Conners 3 showed a good level of concentration, paying more attention to the task and easily inhibiting distracting stimuli. Furthermore, he no longer reacted impulsively to external stimuli and did not display aggressive behaviour towards others. This result remained constant over time.

In addition, the identification of the target figure on the first attempt confirmed the reduction in impulsivity in the figure-matching task with an average response time of 19.8 seconds per item, whereas before the intervention, it was 3 seconds. The result shows that the metacognitively oriented intervention is particularly suitable for solving problems involving cognitive 'mediation' skills.

CONCLUSIONS

Beyond Marco's case, which certainly does not aim to give data with experimental rigour, but only to provide a range of information on how to use the most effective strategies for managing ADHD children's behaviour problems, both in single treatment and within the classroom, we can conclude that, overall, it is possible to achieve significant improvements, both scholastically and socially, in ADHD by adjusting the modalities and intensity of intervention based on a rigorous individualised assessment, as envisaged in the field of behavioural psychology. However, one finding that emerged from this work is that further assessment tools should be prepared to investigate better these children's attentional, behavioural, planning, control and emotional-relational characteristics, to identify different psychological profiles and establish which are more resistant to change.

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