

# Self-instructional cognitive training to reduce impulsive cognitive style in children with Attention Deficit with Hyperactivity Disorder

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## Abstract

**Introduction.** Children with attention deficit with hyperactivity disorder (ADHD) have an impulsive, rigid and field-dependent cognitive style. This study examines whether self-instructional cognitive training reduces impulsive cognitive style in children diagnosed with this disorder.

**Method.** The subjects were 10 children between the ages of 6 and 8, diagnosed with attention deficit hyperactivity disorder (ADHD). The research design was quasi-experimental with pre-test-posttest. The independent variable was the self-instructional cognitive training; the children were grouped into 3 groups by age, and received 30 group sessions. The dependent variable was the impulsive cognitive style which was tested before and after training with the Matching Familiar Figures Test.

**Results.** The pretest-posttest analysis shows a statistically significant reduction in the impulsivity percentile and in number of errors, and a statistically significant increase in latency, after the training.

**Discussion and conclusions.** The results show the effectiveness of self-instructional cognitive training to reduce the impulsive cognitive style of ADHD. Through self-instructional training, children learned to talk themselves through a sequence of organized thoughts that let them solve cognitive tasks in a reflective style.

**Keywords:** Attention deficit hyperactivity disorder, cognitive style, reflection-impulsivity, self-instructional cognitive training.

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# Entrenamiento cognitivo autoinstruccional para reducir el estilo cognitivo impulsivo en niños con el Trastorno por Déficit de Atención con Hiperactividad

## Resumen

**Introducción.** Los niños con el trastorno por déficit de atención con hiperactividad (TDAH) presentan un estilo cognitivo impulsivo, rígido y dependiente del campo. En este estudio se examina si el entrenamiento cognitivo autoinstruccional reduce el estilo cognitivo impulsivo de los niños con este trastorno.

**Método.** Los participantes fueron 10 niños de 6 a 8 años de edad diagnosticados con el trastorno por déficit de atención con hiperactividad (TDAH). Se empleó el diseño cuasiexperimental con pretest-posttest. La variable independiente fue el entrenamiento cognitivo autoinstruccional que consistió en 30 sesiones grupales dirigidas a 3 grupos conformados según la edad cronológica de los participantes. La variable dependiente fue el estilo cognitivo impulsivo, el cual fue evaluado antes y después del entrenamiento mediante el Test de Emparejamiento de Figuras Conocidas.

**Resultados.** El análisis pretest-posttest refleja una disminución estadísticamente significativa del percentil de impulsividad y el número de errores y un aumento estadísticamente significativo de la latencia después del entrenamiento.

**Discusión y Conclusión.** Los resultados demuestran la efectividad del entrenamiento cognitivo autoinstruccional para reducir el estilo cognitivo impulsivo del TDAH. A través del entrenamiento autoinstruccional, los niños aprendieron a hablarse a sí mismos una secuencia de pensamientos organizados para resolver tareas cognitivas de forma reflexiva.

**Palabras Clave.** Trastorno por déficit de atención con hiperactividad, estilo cognitivo, flexibilidad-impulsividad, entrenamiento cognitivo autoinstruccional.

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## Introduction

The attention deficit with hyperactivity disorder (ADHD) is a disorder that stems from a delay in neuropsychological development, causing dysfunctions in the executive control and behavior inhibition mechanisms, and directly affecting the psychological processes of the executive system (working memory and its relation to the anterior attention system, self-regulation of motivation and affect, internalization of language and processes of analysis and synthesis) and executive functions such as planning/organization, flexibility, self-monitoring/assessment, which are directly involved in the tasks of teaching and learning and in social, family and school adaptation (Lavigne & Romero, 2010).

ADHD is characterized by a persistent pattern of inattention and/or hyperactivity/impulsivity that interferes with functioning or development (American Psychiatric Association, 2013). This disorder is hereditary, and there are also risk factors during pregnancy and birth (Larsson, Chang, D'Onofrio & Lichtenstein, 2014; Ketzer, Gallois, Martinez, Rohde & Schmitz, 2012; Rivera-Flores, 2013). Its physiopathological basis is a dysfunction of the frontal-striatal circuit that involves the prefrontal cortex and its relation to the basal ganglia, thalamus and cerebellum (Fernández-Mayoralas, Fernández-Jaén, García-Segura & Quiñones-Tapia, 2010). ADHD is present in approximately 5% of children and 2.5% of adults in most cultures, and the symptoms of inattention, hyperactivity/impulsivity occur before the age of 12 (American Psychiatric Association, 2013).

Inattention is shown in behaviors such as being off task, a lack of persistence, difficulty paying attention and being disorganized; these behaviors are not due to defiant attitudes or a lack of understanding. Hyperactivity refers to excessive motor activity in situations where it is inappropriate, being restless or talking too much. Impulsivity consists of acting hastily without thinking about the consequences, putting one's own safety at risk (e.g. rushing into the street without looking), and frequently interfering in the games, activities or conversations of others. Impulsivity reflects a desire for immediate reward or an inability to postpone gratification (American Psychiatric Association, 2013).

### *Cognitive styles*

Cognitive styles are defined as one's usual, stable strategies that determine how one perceives, remembers, thinks and solves problems (Ramiro, Navarro, Menacho & Aguilar, 2010). They are one's personal ways of processing and strategies for approaching certain tasks (López, Serrano, Delgado, De Llano, Sánchez & Alberola, 2011). The study by López, Serrano, Delgado, De Llano, Sánchez and Alberola (2011) compares cognitive styles of children with and without ADHD; children with ADHD showed more impulsivity, greater rigidity and greater field dependency. Other researchers (López, 2005; Orjales, 2002a) reached the same conclusions.

The cognitive dimension *reflection-impulsivity* emerged from research by Kagan and collaborators in the 1960s (Cairns & Cammock, 2005) and refers to a person's preference to answer quickly, in contrast to others' preference to do so more thoughtfully and so reduce the number of mistakes made on problem solving tasks (Ramiro, Navarro, Menacho & Aguilar, 2010; Bornás, Servera, Serra & Escudero, 1990). Reflection-impulsivity became operational through the measurement of two components, response latency and errors on the Matching Familiar Figures Test (MFF) (Bornás, Servera, Serra & Escudero, 1990). This test has been used in different studies (Orjales & Polaino-Lorente, 1992; López, Serrano, Delgado, De Llano, Sánchez & Iberola, 2011; López, Serrano, Delgado, De Llano, Alberola, Sacristán, Pérez & Camina, 2010; Calderón, 2001; Arco, Fernández & Hinojo, 2004; Mateo, 2006) in order to assess the reflection-impulsivity cognitive dimension in children with ADHD.

*Reflective* children take longer to respond and commit fewer errors (López, Serrano, Delgado, De Llano, Alberola, Sacristán, Pérez & Camina, 2010; Ramiro, Navarro, Menacho & Aguilar, 2010), they have control over their impulses, check their hypotheses and use systematic analysis (López, Serrano, Delgado, De Llano, Sánchez & Alberola, 2011). *Impulsive* children, however, make more errors and answer more quickly (Ramiro, Navarro, Menacho & Aguilar, 2010) due to poor perception processes and poor information analysis (López, Serrano, Delgado, De Llano, Sánchez & Alberola, 2011; Orjales, 2002a).

However, the length of time before responding is not the only thing that determines impulsive-reflective cognitive style. When trying to teach the impulsive children to take longer before answering, they continued to make mistakes; the reflective children, however, are

successful not because they do the task more slowly, but because they use effective information-processing strategies during the time prior to response, resulting in the right solution to the problems (Clariana, 1993).

In effect, there are differences in the *information processing strategies* used by impulsive and reflective persons. Impulsive children answer randomly and unsystematically because they lack problem-solving strategies. Impulsive children obtain incomplete information and respond intuitively without thinking, skipping over important steps of the appropriate problem-solving model, such as observing, gathering information, analyzing, discarding unnecessary data, outlining a plan of action, considering all the response possibilities, making a decision, checking the result, congratulating oneself if the answer is right, or re-analyzing the information and all the alternatives if the answer is wrong (Orjales, 2002a).

Reflective persons use an analytical or detail strategy, characterized by paying attention and weighing all the possible responses, in other words, they analyze the different components of the task based on equivalent comparisons, using an exhaustive, systematic process; they are furthermore motivated to correctly solve intellectual problems and they have good recall strategies (Clariana, 1993). The studies by Kagan, Rosman, Day, Albert and Phillips (1964) sustain that there are two cognitive dispositions in the production of analytical concepts: a) the tendency to reflect on all the alternative solutions in situations where several alternative responses are available simultaneously, and b) the tendency to analyze the alternatives in their constituent parts; where the production of analytical concepts is inversely related to extreme degrees of hyperactivity and distractability.

### *Self-instructional cognitive training*

Meichenbaum and Goodman (1971) successfully treated impulsivity by applying self-instructional cognitive training, which required the impulsive child to talk to himself/herself, at first aloud, and later with inner talk, in an attempt to increase self-control. The first applications of self-instructional training were in a population of impulsive and hyperactive children (Meichenbaum, 1977) and the objective was to reduce impulsivity (Bornás, Servera, Serra & Escudero, 1990; Meichenbaum, 1977).

Meichenbaum was influenced to propose self-instructional cognitive training by the studies of Luria, who used self-talk in a sequence where the child is first controlled by the external verbalizations of others (adults), then the child produces his/her own verbalizations aloud, and finally at the age of 5 or 6, the child controls his/her behavior through inner self-talk. Meichenbaum was also influenced by research on cognitive mediational strategies in children, where self-generated strategies such as self-instruction and/or self-praise (saying a particular sentence or thinking a specific thought), while completing a task, were shown to reduce the frustration of delaying gratification, and to help regulate behavior (Kendall & Braswell, 1993).

Children with ADHD show difficulty with self-talk on problem-solving tasks and in self-creation of rules for guiding their behavior, especially when the behavior must be organized in a long chain of hierarchically ordered actions, and when self-talk would make it possible to use the rules of instructions learned in the past (Barkley, 1997; cited by Orjales, 2002a).

In order to help slow down and organize the thought of impulsive children, Meichenbaum (1977) felt it necessary to have them verbalize their thoughts aloud, in order to then help them organize these thoughts by following a series of steps which he called self-instructions. The objective was to interrupt the chain of incorrect thoughts that the impulsive child thinks moments before solving a problem (prepotent responses). Through the learning of self-instructions, impulsive children substituted disorganized thoughts with a sequence of useful thoughts for problem solving.

In Meichenbaum's training in cognitive or self-instructional mediation, verbal mediation consisted of speaking pertinently to oneself when facing something that one wishes to learn, a problem that needs to be solved, or a concept that one wishes to grasp (Polaino-Lorente, Avila, Cabanyes, García, Orjales & Moreno, 1997).

Conclusions from research on verbal control in the laboratory and observational studies on self-talk and problem solving show that impulsive children do not have the habit of spontaneously analyzing their experiences in cognitive mediational terms, they do not formulate or internalize rules to guide them in new learning situations. In other words, impulsive children do not understand the nature of the problem or task, so they cannot discover what

mediators to use (*deficient understanding*), they may have an internal repertory of cognitive mediators, but they fail to produce them adequately and spontaneously (*deficient production*); furthermore, the mediators that the child produces do not guide the behavior that he/she is carrying out (*deficient mediation*). The objective of self-instructions is to teach impulsive children to understand the task, spontaneously produce mediators and strategies and use them to guide, monitor and control their performance, and thus to improve the cognitive process comprising the stages of comprehension, production and mediation (Meichenbaum, 1977).

Meichenbaum describes that, in the first level of training, the therapist or tutor models behaviors that lead to the successful completion of a task, while saying aloud the instructions that guide his/her behavior to solve the task. These verbalizations (self-instructions) are specific to the task and include sentences that define the problem (for example, clarifying and understanding the exact requirements of the task), one's approach to the problem (planning a general strategy for solving the problem), focus one's attention and selection of a response, with self-reinforcement for correct execution, or using a statement to motivate oneself and handle an incorrect execution. After observing the therapist carry out different tasks, the child performs a task while talking to himself/herself aloud. Usually at this point, the therapist helps the child to remember the modeled sequence of self-talk. The therapist and the child frequently talk back and forth in order to execute the tasks, and as they progress, the therapist whispers this self-talk to child, motivating him or her to do the same; later, both the therapist and the child use silent self-talk to control and direct performance of the task. Next, the self-instructional training includes training in the use of self-talk directly related to the task, self-reinforcing statements and modeling of appropriate behaviors for the task (Kendall & Braswell, 1993).

Orjales (2007) adapts Meichenbaum and Goodman's schema from 1971 (steps 2 to 6) and expands it by adding the first self-instruction, "First I look and say everything I can see" (step 1), resulting in 6 self-instructions that help children with ADHD to diminish cognitive impulsivity:

- Step 1: First, I look and say everything I can see.
- Step 2: What do I have to do?
- Step 3: How am I going to do it?
- Step 4: I have to pay close attention (and see all the possible answers)
- Step 5: Now I can do it!



- Step 6: It didn't turn out right. Why not? (I review all the steps) Ah, that's why! OK, next time I won't make that mistake.

According to Meichenbaum (1977), the procedure for individual administration of self-instructional cognitive training is as follows:

1. An adult acts as a model, and performs the task while using self-talk, speaking aloud (cognitive modeling).
2. The child performs the same task by following the instructions of the model (open external guidance).
3. The child performs the task while speaking aloud the instructions (open self-guidance).
4. The child whispers the instructions to himself/herself while performing the tasks (open self-guidance).
5. The child performs the tasks while guiding his/her own performance through inner talk (silent self-instructions).

Self-instructions strengthen the sequence of thought, their purpose is to facilitate comprehension of the situations, generation of strategies and mediators needed for problem solving, and use of these mediators to guide and control one's behavior (Miranda & Soriano, 2010).

### *Objective and hypothesis*

In accordance with the above, the *objective* of this research was to determine whether self-instructional cognitive training decreased the impulsive cognitive style seen in children with ADHD when solving cognitive tasks. This objective was defined in the following research *hypothesis*: Self-instructional cognitive training will decrease the impulsive cognitive style because learning the self-instructions will allow children with ADHD to solve cognitive tasks systematically and with reflection.

## Method

### *Participants*

Participating were 10 children diagnosed with ADHD, between the ages of 6 and 8, born in Arequipa (Peru). There were 9 boys and 1 girl, all of them enrolled in private schools. All the children met the following inclusion criteria:

- 1) 77th percentile or higher on the total ADHD quotient, as measured by Gilliam's (1995) Test for Attention Deficit with Hyperactivity Disorder, parents' scale.
- 2) 86th percentile or higher on impulsive cognitive style as measured with the Matching Familiar Figures Test-20 by Cairns and Cammock (2005).
- 3) An IQ of 90 or higher on the WISC-IV (Weschler, 2005).
- 4) The absence of any other organic or psychopathological disorder.
- 5) Using medication.

Given that the self-instructional cognitive training was applied in a group format, the children were divided among 3 treatment groups according to chronological age. One group contained 3 six-year-olds, another group had 4 seven-year-olds, and another group had 3 eight-year-olds. The children participated in the self-instructional cognitive training as a group.

### *Instruments*

We used the Matching Familiar Figures Test MFF-20 by Cairns and Cammock (2005). This consists of a perceptive matching test for measuring reflection vs. impulsive cognitive style. Low scores correspond to a reflective cognitive style (long latency and lower number of errors) and high scores correspond to an impulsive cognitive style (short latency and increased number of errors). The test is made up of 20 total assessment items and two initial practice items. Each item consists of the simultaneous presence of a model drawing, familiar to the child (eyeglasses, bear, house) and 6 different response choices. The subject's task is to find, among the 6 response choices, the one that exactly matches the model. The test is applied individually, targeting children between the ages of 6 and 12, and lasts approximately 15-20 minutes.

The MMF-20 presents internal consistency values (Cronbach alpha) between 0.92 and 0.98 for latencies ( $M = 0.95$ ), and 0.68 and 0.82 for errors ( $M = 0.76$ ). Theoretical validity of the test reveals high negative correlations between latency and errors ( $r = -0.65$ ). A temporal consistency study with children between ages 6 and 9 (studied over a two-year period) presents the following longitudinal consistency coefficient values: for boys, between 0.42 and 0.61 for latencies, and between 0.72 and 0.92 for errors; for girls, coefficients between 0.17 and 0.44 for latencies, and between 0.61 and 0.97 for errors; longitudinal consistency coefficients for impulsivity were between 0.46 and 0.61 for boys, and between 0.46 and 0.56 for girls (Buela-Casal, Carretero-Dios, De los Santos-Roig & Bermúdez, 2003; cited by López, Serrano, Delgado, De Llano, Alberola, Sacristán, Pérez & Camina, 2010).

### *Procedure*

The total sample of ADHD children participated in Orjales's (2002b) training program for deciphering written instructions, which is based on Meichenbaum and Goodman's (1971) self-instructional cognitive training and the self-instructional schema that Orjales expanded (2007).

The objective of the training program for deciphering written instructions is to reinforce the self-instruction, "What do I have to do?"; it also forms part of a broader training program to reduce impulsivity and to develop problem-solving strategies (Orjales, 2002b).

Orjales's (2007) expanded self-instructions model, used in this research, contains 6 self-instructions or self-talk that are modeled in the group (at first the therapist speaks the self-instructions aloud, then the children say them aloud to themselves, then the children whisper them, and finally they use inner talk, silently). The self-instructions were as follows:

- "First I look and say what I see" (self-instruction 1), then the children describe in precise, orderly manner all the elements that make up the task.
- "What do I have to do?" (self-instruction 2), "the written part will tell me".
- "How am I going to do it?" (self-instruction 3), "reading it step by step".
- "I have to pay close attention" (self-instruction 4).
- They say each instruction for the task and solve it step by step.
- "Did it turn out right?" (self-instruction 5).
- Group correction of the exercise: analysis of the alternative proposed by each child, evaluation of the pros and cons of each, selection of the right choice.

- “It turned out right” / “It turned out wrong. Ah, that’s why! Next time I won’t make that mistake” (self-instruction 6).

In order to teach the self-instructions, the procedure designed by Meichenbaum (1977) was used, taking care to use the following sequence with the verbalizations modeled as a group, as the children progressed through the training program:

- 1) The therapist models the task while talking to himself/herself.
- 2) The children do the task while the therapist leads them aloud, step by step, in each self-instruction and the instructions specific to each task.
- 3) The children do the task, speaking aloud to themselves the self-instructions and the instructions specific to each task, while the therapist whispers the self-instructions.
- 4) The children do the task, whispering quietly to themselves the self-instructions and the instructions specific to each task, while the therapist solves the task with silent self-instructions.
- 5) The children do the task using inner talk (silent self-instructions and specific instructions).

The sessions were carried out in a room prepared especially for that purpose, and the day and time for each group’s training was established and maintained throughout the treatment. The sessions were initiated when all the children of the group had arrived, a poster with the self-instructions was placed in a visible location, a blackboard was in front of the children, and each child had a booklet containing the Orjales (2002b) program worksheets for deciphering written instructions.

### *Design and data analyses*

In the first week, in the pretest phase, all participants were evaluated with the Matching Familiar Figures Test (MFF-20) whose objective was to measure impulsive cognitive style. Next, the children participated in the self-instructional cognitive training, applied in 30 group sessions over different days, each session lasting 60 minutes. Finally, in the posttest phase, participants were again assessed using the MFF-20.

Before and after scores for impulsive cognitive style were compared using Student’s *t* test, with SPSS 15.0 (statistical software). Values of  $p < 0.05$  were considered statistically significant, that is, structural and independent from the random sampling.

## Results

The pretest-posttest analysis is presented in Table 1 and reflects a statistically significant decrease in the impulsivity percentile ( $t=7.83$ ;  $p<.05$ ) and in the number of errors ( $t=8.31$ ;  $p<0.05$ ) and a statistically significant increase in latency ( $t=-6.74$ ;  $p<.05$ ). The statistically significant differences between the pretest and the posttest show the effectiveness of the self-instructional training for reducing impulsive cognitive style in children with ADHD.

**Table 1. Analysis of the *t* test before and after the self-instructional training**

Test		Pre test			Post test			Pretest- Posttest
		No.	Mean	SD	No.	Mean	SD	t
MFF- 20	Impulsivity percentile	10.00	59.30	(23.25)	10.00	1.70	(0.68)	7.83*
	Errors	10.00	65.0	(48.12)	10.00	-140.1	(61.46)	8.31*
	Latency	10.00	10.80	(64.01)	10.00	297.0	(118.08)	-6.74*

\*  $p < .05$

## Discussion and Conclusions

The objective of the study was to determine the effect of self-instructional cognitive training on impulsive cognitive style in children with ADHD. The results show that the impulsive cognitive style, characteristic of ADHD, decreases significantly after applying self-instructional cognitive training based on the Meichenbaum and Goodman (1971) theory, the expanded self-instruction schema (Orjales, 2007) and the Meichenbaum (1977) procedure for teaching the self-instructions.

Meichenbaum and Goodman (1971), Kendall and Wilcox (1980) also found *self-instructional cognitive training* to be effective for *reducing impulsivity*. Furthermore, in like

manner to this investigation, other studies used the Meichenbaum and Goodman schema and also obtained positive results from self-instructional training for reducing cognitive impulsivity as assessed on the MFF-20 in children diagnosed with ADHD (Arco, Fernández & Hinojo, 2004; Calderón, 2001).

The importance of this study is that it has put into practice a program for addressing a cognitive problem that affects children with ADHD in their classroom functioning and at home. Based on the results, we conclude that self-instructional training reduces cognitive impulsivity. Thus, children with this disorder learn to use reflective strategies for solving problems and decrease their tendency to answer randomly, hastily and to make mistakes, without taking in all the information, all behaviors that are typical of the impulsive cognitive style. The use of reflective strategies for solving tasks may in turn improve the academic performance of children with ADHD. For this reason, self-instructional training should be applied in the classroom.

In the present study, the children received self-instructional training in a room that was especially equipped for this purpose. If it were to be applied in the classroom, we recommend that the same procedure be used, but it should be preceded by teacher training. In my town, Arequipa (Peru), children with ADHD and no comorbidity attend regular schools, and the teacher must be able to effectively handle their educational needs.

There are studies (Arco, Fernández e Hinojo, 2004; Miranda, Soriano, Presentación & Gargallo, 2000) that use self-instructional training in the classroom and that accompany this intervention with other cognitive behavioral techniques (training parents and teachers, behavior modification, self-control techniques, self-assessment, modelling, reinforcements, training in social skills, etc.) and as a result, children with ADHD have progressed in decreasing the symptoms of this disorder and problem behaviors in the classroom.

In this research, self-instructional cognitive training has produced good results in reducing cognitive impulsivity through teaching a sequence of more organized and reflective thoughts called self-instructions (First, I look and say everything I can see, what do I have to do?, how am I going to do it?, I have to pay close attention (and see all the possible answers), now I can do it!, It didn't turn out right, why not? (I review all the steps), ah, that's why! OK,

next time I won't make that mistake). Self-instructions allow children to replace inappropriate or disorganized thoughts about the task, to regulate their behavior and reduce impulsivity.

Self-instructional training is used to help students with difficulties with impulsivity. For example, a child with ADHD who responds to the teacher's questions without waiting for his/her turn, can be trained to reply silently to himself/herself, without interrupting the class, or to say silently "I know the answer, but I can wait for my turn" (Shillingford, Lambie & Walter, 2007). Self-instructions help people with ADHD to adopt a more systematic, productive approach to tasks and problem solving (National Institute for Health and Clinical Excellence, 2009, cited by Serrano-Troncoso, Guidi & Alda-Diez, 2013).

Despite the positive results from self-instructional cognitive treatment for decreasing impulsive cognitive style in ADHD, I concur with Orjales (2007) in sustaining that self-instructional cognitive training is one useful technique, but only a small part of the multimodal treatment that is required in a population of children with ADHD. This would include a program of family action, a program of school intervention and a program of specific, direct treatment of the person diagnosed with the disorder, to include pharmacological treatment and an intervention program that is not only cognitive but also behavioral and emotional.

Intensive, multidisciplinary treatment helps children with ADHD to cope with their difficulties (Miranda & Presentación, 2000). Clinical practice shows that the combination of different techniques, connected together in a coherent intervention model, results in significant clinical improvement to much greater measure than does isolated use of single techniques (Mas, 2009). Such a model must incorporate the child, family and school (Abad, Ruiz, Moreno, Herrero & Suay, 2013). The combination of pharmacological and psycho-educational interventions for treating ADHD is the present norm within the scientific and professional community (Lavigne & Romero, 2010).

One important aspect in this investigation is certain characteristics of the families from the town of Arequipa (Peru). Some parents feel that the disorder is the product of poor education that the children have received; moreover, some of them prefer school psychology interventions instead of pharmacological treatment. Thus, there must be psycho-educational intervention with the parents, with regard to the symptoms for diagnosing the disorder, its etiology, evolution and treatment.

In this respect, Duda (2005, p. 43) expresses the following: “Children with ADHD are not necessarily spoiled, but they often are unable to control the impulse to speak (even though the teacher is speaking to the class), the impulse to move (even though they are taking a test), the impulse to have a toy (even though a friend is using it), etc.” Children with ADHD cannot resist the temptation to play instead of finishing schoolwork because they have a deficit of inhibitory control, in other words, it is difficult for them to activate specific information and inhibit unnecessary automatic responses (Sánchez-Pérez & González-Salinas, 2013).

One of the *limitations* of this study is the small sample size. However, the results obtained are consistent with earlier studies. I recommend replicating the present study with a larger sample. Furthermore, in light of the positive results obtained, a next research step might be to investigate whether these results are maintained 6 months or 1 year after completing the training.

Finally, there must be continued effort to offer specialized, individualized and custom-made interventions that meet the specific needs, potential and problems of each child with ADHD. Likewise, multidisciplinary work should be encouraged, combining different approaches (medical, psychological, educational) in the attention to these children with ADHD.

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